
*** GLOSSARY OF ***
TERMS *and* **PHRASES**
CONNECTED WITH THE
MINING INDUSTRY

GEO. A. CROFUTT

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GLOSSARY OF TERMS *and* PHRASES CONNECTED WITH THE MINING INDUSTRY

IN COMMON USE
IN THE MINING REGIONS
OF AMERICA

THE list is thought to be very complete, and includes the terms used by Spanish-Mexican, Cornish, English, French, Italian, Dutch, Greek, Latin and American Miners; to which is included a Lexicon of the Principal Minerals, and Miscellaneous matter connected with the mining industry.

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PREFACE

In our "Grip-sack Guide of Colorado" for 1885 we published a glossary of terms and phrases used by the miners of different nationalities in the mining regions of Colorado.

So far as we know, it was the only list of the kind ever published, and cost us much time and labor in research—imperfect as it was.

We now present a more complete list, and include a lexicon of the principal minerals, and miscellaneous matter connected with the mining industry.

THE AUTHOR

The Author is under obligations to Prof. Geo. C. Shiels, Professor of Languages, Denver, Colo., for the arrangement of the derivations of the various terms and phrases used in this book.

KEY

(S-M)	-----	Spanish-Mexican
(A)	-----	American
(L)	-----	Latin
(G)	-----	Greek
(E-C)	-----	English-Cornish
(F)	-----	French
(I)	-----	Italian
(D)	-----	Dutch

TERMS AND PHRASES CONNECTED WITH THE
MINING INDUSTRY, IN COMMON USE IN THE
MINING REGION OF AMERICA.

A

Abra (S-M). A fissure; a cavity in the rock or lode.

Abronzado (S-M). Yellow copper ore, or sulphuret of copper.

Acarreadores (S-M). Wood-carriers.

Acceleration (A). An increase in the velocity of a moving body.

Acequia (S-M). A ditch.

Acero (S-M). Steel.

Achicadores (S-M). Workmen employed in removing the water in *botas*.

Achicar (S-M). To diminish or decrease the water in the shaft, or other workings of the mine.

Acicular (S-M). Straight and slender crystals.

Acuña (S-M). A die for coining.

Acuñar (S-M). To coin.

Acunacion (S-M). Coining.

Acuñador (S-M). One who coins money.

Adamant (G). A very hard stone—a diamond.

Adesite (A). Porphyrite lava, dark color, found embedded in feldspar.

Ademar (S-M). To timber.

Ademador (S-M). A timber man; carpenter in a mine.

Ademe (S-M). Timber works for supporting a mine.

Adit (A). A horizontal entrance into a pit; an opening drain.

Administrator (A). The superintendent.

Administration (A). The management.

Adobe (S-M). Sun-dried brick; sod sometimes used.

- Adrift (A).** Floating at random; hunting a vein of ore.
- Afinacion (S-M).** Refining ores.
- Affinity (A).** The attraction by which the particles of different substances unite.
- Agata (S-M).** Agate stone.
- Aggregated (A).** Where the component parts may be separated by mechanical means.
- Aquafuerte (S-M).** Nitrous, or nitrous acid; aquafortis.
- Ahondar (S-M).** To sink, or deepen.
- Ahonde (S-M).** Sinking, or digging downward.
- Air (A).** Is 815 times lighter than water and 11.065 times lighter than mercury. At seven miles above the surface of the earth the air is four times greater than at the surface. At fourteen miles it is sixteen times lighter. At twenty-one miles, sixty-four times lighter.
- Air-machines (A).** Machines for forcing in fresh air, or withdrawing foul from badly ventilated mines.
- Air-pipes (A).** Used in connection with air-machines, or for ventilating mines.
- Aitch-piece (A).** The plunger; lift where the clacks are affixed.
- Alabastro (S-M).** Alabaster.
- Alabaster (G).** Gypsum; massive sulphate of lime; a subtranslucent, yellowish, banded, calcareous stalagmite.
- Albaredon (S-M).** A dyke.
- Albayalda (S-M).** White lead.
- Albanil (S-M).** A mason; a bricklayer.
- Albergue (S-M).** A hollow, or natural den.
- Aleacion (S-M).** The act; method of alloying metals.
- Alear (S-M).** To alloy metals.
- Alliacious (L).** The peculiar garlic odor of arsenical minerals when struck or heated.
- Alloy (F).** Debased by mixing two or more metals. See under "Miscellaneous."

- Alluvium (L). A deposit of loose gravel between the superficial vegetable mould and subjacent rock.
- Alimentos (S-M). An allowance as subsistence; a kind of "grub-stake" to miners until their mines become profitable.
- Almacen (S-M). A storeroom; warehouse.
- Almagra (S-M). Red ocher; ruddle.
- Almud (S-M). The twelfth part of a fanega.
- Alpine (F). Lofty mountain; very high.
- Alquifou (F). A lead ore, used for green varnish or pottery.
- Alquifal (F). Galena ore.
- Alquilar (S-M). To hire.
- Alta (S-M). The upper part.
- Alumina (L). Sesquioxide of aluminium, the chief consistent of clay.
- Aluminium (L). A bluish-white metal, obtained from alumina, very light and strong.
- Alumbre (S-M). Alum.
- Amalgam (L). Quicksilver, combined with gold or silver, so that its form is changed from a liquid to a solid cake.
- Amalgamating (A). The process of separating gold and silver from their ores by mixing them with mercury.
- Amass (A). To collect in a heap; to pile up.
- Amatista (S-M). Amethyst.
- Amethyst (G). A purple variety of rock-crystal.
- Amiaño (S-M). Amianthus.
- Amoldar (S-M). To mould.
- Amorphous (G). Without form.
- Amparo (S-M). Continued possession of a mine to secure title; keeping the necessary number of men at work in accordance with mining laws.
- Analysis (G). Separating constituent elements.
- Anchura (S-M). Roominess; width.
- Ancony (G). A bar of iron unwrought at the ends.

Angle-iron (A). Pieces of iron of an angular form, used for joining, at an angle, plates of tanks.

Anguto (S-M). A corner; an angle.

Anhydrous (G). Without water of crystallization.

Ante (A). Rubbish, containing little or no mineral.

Anneal (F). To heat and then cool metals; tempering.

Anorthite (G). A variety of lime-feldspar.

Antholites (G). Fossil inflorescence.

Antimony (L). A brittle white ore; metal.

Aparejo (S-M). A pack-saddle; a set of harness; a block and fall; a table.

Apartado (S-M). Works for separating silver and gold.

Aperos (S-M). Utensils; materials; such as gunpowder, paper, fuse, etc., for blasting.

Apex (A). The top of a hill, mountain, or vein that descends into the rock or earth.

Apique (S-M). Digging downward in a vertical direction.

Apolvillados (S-M). Rich minerals.

Apuradores (S-M). Men who re-wash the earth from the tinajas.

Arborescent (L). Mineral of a leaf or twig-like form.

Arch (A). Ground left unworked near a shaft.

Archimedean Screw (G). A spiral screw, fitting close in a tube, for raising water or other liquids; sometimes for grain in elevator buildings.

Arched (A). Tunnels or drifts in a mine, when built with stone or brick, are generally arched over.

Arcilla (S-M). Clay.

Arenilla (S-M). Fine sand.

Argillaceous (G). Of clay-like character.

Argentiferous (L). Rock or ore, or metal-bearing silver.

Arrastra (S-M). A mill for grinding ores; a crude contrivance, circular in form, where ores are ground to powder by attrition of heavy stones secured by ropes to a long pole, about mid-way, one end of which is fastened on a pivot in the center of the circle and the other end hauled around by hand or animal power. It is also employed in the amalgamation of gold and silver ores; is constructed in various forms, and propelled by steam or water power.

Arms (A). The braces connecting the hub of the fly-wheel with the rim of a steam engine.

Arreador (S-M). Horse driver for mulacates.

Arriero (S-M). A muleteer.

Arroba (S-M). Twenty-five pounds; Spanish weight.

Arroya (S-M). A ravine; water-worn.

Arsenico (S-M). Arsenic.

Asbesto (G). Asbestos.

Asbestos (G). A mass of flaxy, fibrous crystals, in some hornblendic minerals.

Aserrar (S-M). To saw.

Asfalto (S-M). Asphaltum.

Aslope (E-C). In a slanting position.

Asphalt (G). A solid bitumen, produced by the agency of heat and pressure upon lignitic and coal-bearing strata; generally black, and more or less lustrous; used in paving streets.

Assaying (A). Finding the percentage of a given metal in ore or bullion.

Assessment (A). Amount levied on capital stock; amount of work required by the mining laws to be done on a mine annually to perfect and hold title.

Asserrador (S-M). A sawyer.

Astilero (S-M). Opening in the forest; pasture.

Atacadero (S-M). A rammer.

Atacador (S-M). Ramrod for tamping the charges in blasts.

Atajo Abierto (S-M). An open cut in a mine; where it is worked like a quarry.

Atajador (S-M). A boy, hostler, who attends the mules, horses, burros, etc.

Atarge (S-M). A water course of masonry.

Atecas (S-M). Men who collect water in buckets, and fill skins in the shafts with mud and water, in order to pass it off by the shafts.

Atisador (S-M). A man who attends the furnaces; a stoker.

Attle (E-C). Waste rock matter.

Attrition (A). A grinding or wearing down in particles.

Attierras (S-M). Rubbish in the mine retarding work.

Audit Level (A). A horizontal excavation used as a drain for the mine.

Audit (A). A drift or tunnel on a lode or vein.

Audiencia (S-M). Principal tribunal of justice.

Augite (G). Nearly allied to hornblende; a black or green mineral, found in lava.

Augite (G). Composed of lime, sand and magnesia, with the oxide of iron or manganese.

Aureus (L). An old Roman coin.

Auriferous (L). Rock or ore that bears gold.

Avalanche (F). A snowslide ; a descending mass from a high, steep mountain.

Average Produce (A). The amount of coin value received as the yield of any number of tons of ore by mill run or smelting process, divided by the number of tons, gives the average value of the ore; after which the ores from the same mine are rated *above* or *below* the average, as they prove to be rich or poor.

Aviado (S-M). The owner of a mine, with plenty of funds for working it.

Aviador (S-M). The person who supplies funds for working a mine.

Avio (S-M). Cash advanced for working mines.

Avios (S-M). Tools; implements.

Ayudante (S-M). An assistant.

Azarcon (S-M). Red lead.

Azoguero (S-M). A person who superintends the process of amalgamation.

Azogue en Caldo (S-M). Quicksilver.

Azoguera (S-M). Storeroom for quicksilver.

Azogue (S-M). Quicksilver; silver ore adapted for amalgamation.

Azogue Ordinario (S-M). Ordinary ore for amalgamation.

Azogue Apolvillado (S-M). Best ore for amalgamation.

Azogue Comun (S-M). Common ore for amalgamation.

Azogue Razonable (S-M). Passable ore for amalgamation.

Azufre (S-M). Sulphur.

Azurite (L). Blue copper ore.

B

- Babbler** (E-C). A rubber-tongue gossip.
- Batch of Ores** (E-C). The quantity of ores sent to the surface by any gang of men.
- Back** (A). That portion of a lode, or level, the highest or the nearest to the level above.
- Back** (A). The reverse side of the bedplate in engines with girder frames.
- Backwater** (A). Water held back by a dam or turning of a water wheel.
- Bal** (E-C). A term for a mine.
- Bank** (A). The pit's mouth at level.
- Banksman** (A). Man who handles the buckets at the mouth of shaft.
- Bancos** (S-M). Rocks intercepting the vein, causing it to take a different direction.
- Baño** (S-M). The last application of quicksilver to a torta.
- Barium** (L). Metallic base of barytes.
- Bajo** (S-M). The lower part; beneath.
- Barra** (S-M). The equal shares into which the interest in a mine is divided—usually twenty-four; a bar; a crow.
- Bar Diggings** (A). Washing on river bars for gold.
- Barriers** (A). Unworked deposits left to prevent drain from mine to mine.
- Barrata de Laplata** (S-M). A silver bar; 1,080 ounces.
- Bar of Ground** (A). A vein or ridge of different description of rock or earth, etc., from that in its vicinity.
- Barren Contact** (A). A contact vein, or a place in the contact vein which has no mineral.
- Barrena** (S-M). A boring drill used in blasting.
- Barrenero** (S-M). A boy attendant with the boring tools.

- Barrenos (S-M).** Holes made in the rock for blasting.
- Barreteros (S-M).** Miners who work with picks, crowbars and wedges.
- Barro (S-M).** Loam, clay, mud, etc.
- Baryta (L).** A heavy spar; heaviest of earthy matter.
- Barquina (S-M).** A large furnace.
- Barquines (S-M).** Forge; bellows.
- Basalto (S-M).** Basalt; a grayish mineral, volcanic, a hard, dark looking rock.
- Base (A).** The substance to which an acid is united.
- Base Bullion (A).** Precious metals and lead mixed in bars or pigs, weighing 100 pounds or more, convenient for transportation.
- Base Metals (A).** All metals inferior to gold, silver, platinum and mercury.
- Batea (S-M).** A vessel used for rewashing.
- Bath Metal (A).** An alloy of nine parts of zinc to thirty-two of copper.
- Beat Away (A).** To excavate in hard ground.
- Bed (A).** A horizontal vein of ore; a seam; a deposit.
- Bed Rock (A).** The formation underlying pay dirt.
- Bell Metal (A).** A composition of copper, tin, zinc and antimony.
- Belly (E-C).** The heavy side of an eccentric.
- Bend (A).** Any indurated argillaceous substance; indurated clay, etc.
- Beneficiar (S-M).** To dress ore, or extract metal from ore.
- Bessemer Steel (A).** Steel made by passing a blast of air through molten cast iron, so as to get rid of the carbon and silicon, and then adding enough pure cast iron to supply carbon for the formation of steel; named for the inventor.
- Bigorneta (S-M).** A small anvil.
- Bimetallism (A).** A mixed standard of gold and silver; the relative value of the metals to be determined.

- Bismuth (G).** A metal, crystalline, reddish-white, brittle.
- Bitch, Son of (A).** A fighting word in the West; a challenge.
- Bitumen (L).** Includes liquid mineral substances—naphtha, petroleum—as well as the solid minerals, pitch, asphalt, mineral rubber, etc.
- Black Chalk (A).** A kind of shale or clay-slate, containing much carbon.
- Black Jack (E-C).** Zinc blende; sulphate of zinc.
- Blast Furnace (A).** A furnace for smelting ores requiring a very high temperature, obtained by forcing a blast of air into the furnace from beneath.
- Blasting (A).** Driving a hole into the rock with a steel drill, inserting explosives, confining it, and then setting fire, resulting in tearing the rocks into fragments.
- Blende-Blenda (D).** A composition of iron, zinc, sulphur, silex and water, a substance when scratched emits a phosphoric light.
- Blind Lode (A).** A lode having no outcrop.
- Bloom (A).** A mass of crude iron from the puddling furnace, while undergoing its first hammering.
- Blossom Rock (A).** Float ore, found upon the surface or near where lodes or ledges outcrop; detached fragments.
- Blow Out (A).** An outcrop of widening vein matter.
- Blower (A).** A smelting furnace.
- Bob (E-C).** The engine beam.
- Boca (S-M).** The first opening made in a mine; the pit; mouth; entrance, etc.
- Bochorno (S-M).** Foul air; vapor; suffocating heat; want of ventilation.
- Bonnet (E-C).** The term applies to the cover of the steam chest of an engine.
- Bonanza (S-M).** Is good luck; a large body of ore; a rich strike; an abundant treasure. "He struck it rich; he has a bonanza."
- Bonney (E-C).** A bed of ore that communicates with no vein of ore.

- Boom, or Bum (A).** Ditch; a ditch or channel washed through to bed rock to expose lodes by water, accumulated at the head in a dam and suddenly let loose.
- Boosy (E-C).** Tipsy; merry from intoxicants.
- Bordeta (S-M).** A small pillar.
- Bordes (S-M).** A border of ore left untouched by previous workings.
- Borrasca (S-M).** The mine that does not pay expenses; is in an unproductive state.
- Bosses (A).** A rock studded with mineral, quartz, etc.
- Bota (S-M).** A sack made of skins, in which water is lifted in the mines.
- Bota-chica (S-M).** A small leather sack.
- Bota Grande (S-M).** A sack made of two or more hides used to extract water; worked by whims.
- Bottoms (A).** The lowest workings.
- Boulders (A).** Large stones of various sizes; water-worn, round mass of rocks.
- Bouncer (A).** A saloon rough, ready at all times for a drink or a fight.
- Brace (A).** The woodwork over the mouth of a shaft, or winze, to which the hoisting tackle is fixed.
- Branch (A).** A small vein which separates from the main lode.
- Brass (A).** An alloy of copper and zinc.
- Brattice (E-C).** Bulkhead.
- Brazing (A).** Soldering with an alloy of brass and zinc.
- Breast (A).** That part of the bedplate which is back of the crossheads in engines of the Corliss type.
- Breast (A).** The face of a tunnel or drift.
- Breasting Ore (A).** Taking ore from the face, breast or end of a tunnel.
- Breccia (I).** Angular rocks cemented together, presenting colors.

Bristol Diamond (E-C). Bright crystals of colorless quartz.

Bronce (S-M). Brass; gun metal; iron pyrites, etc.

Bronze (A). An alloy of copper and tin; sometimes a little zinc and lead.

Brood (E-C). Impurities mixed with the ore.

Bryle (G). Indications of the presence of a lode, on or near the surface.

Bucking Iron (E-C). The tool with which the ore is pulverized.

Bucking Plate (E-C). An iron plate on which the ore is placed for being bucked.

Buckers (E-C). Breakers of ore.

Buddle (E-C). A contrivance by which the stamped tin is washed from its impurities.

Buddling (E-C). Separating the ores from foreign substances.

Bullion (A). Precious metals; gold and silver in bars, not coined.

Bunk (D). A rudely constructed bed.

Burilada (S-M). A chip taken from a lot of silver to decide its value.

Burro (S-M). Of the ass family.

Burro (S-M). A hand whim; a windlass.

Buscones (S-M). Miners who work mines on shares; tributers.

Buytron (S-M). Furnace for smelting ores.

C

- Caballo (S-M).** A horse; a quantity of sterile mountain rock immersed in the rock.
- Cable's Length (A).** Seven hundred and twenty feet.
- Cache (F).** Hiding place for food and valuables not wanted for the time being.
- Cage (A).** The elevator used for hoisting and lowering the ore cars, men and materials of a mine.
- Cajon de Granze (S-M).** The pit to receive the crushed ore.
- Cajon (S-M).** Two montons of thirty-two quintals each.
- Calamine (L).** Carbonate of zinc, adhering to the base of the furnace when smelted.
- Calaverite (L).** Gold telluride, sometimes called "sylvanite."
- Calcareous (L).** Containing a large amount of lime.
- Calcite (L).** Carbonate of lime, crystallized; calc-spar.
- Calcium (A).** Metallic base of lime.
- Calc-spar (L).** Crystallized carbonate of lime.
- Calcine (L).** To reduce to a powder.
- Calderas (S-M).** Boilers.
- Cale-sinter (L).** Stalactitic carbonate of lime.
- Cale-tuff (E-C).** A loose deposit of carbonate of lime; calcareous tufa.
- Calicheros (S-M).** Lime burners.
- Calientes (S-M).** Warm ores, containing sulphurets of iron and copper, and no calcareous matter.
- Caliche (S-M).** Calcareous matters.
- Calx (L).** The substance of a metal or mineral which remains after being subjected to violent heat.
- Canella (S-M).** Used to cover the fire to charge for blasting.

- Canada del Burro (S-M).** Donkey canon.
- Canon (S-M).** Canyon; a deep mountain gorge or ravine between high and steep ridges, worn by streams of water or mountain snowslides.
- Canos (S-M).** Tubes; pipes.
- Cantero (S-M).** A stone mason; quarryman.
- Cantera (S-M).** A quarry.
- Cap Rock (A).** Formation overlaying the ore vein; pinching out the mineral.
- Carbon (L).** A nonmetallic element, pure as diamond and charcoal.
- Carbonate (L).** A geological formation which carries silver ore and runs from ten to seventy-five per cent. in lead, together with dirt, sand, arsenic, and other matters. It varies in appearance.
- Carboniferous (L.)** Containing coal.
- Carboneros (S-M).** Makers and sellers of charcoal.
- Carga (S-M).** Three hundred and eighty pounds, Spanish; a load for a pack animal; a charge for blasting.
- Carilleros (S-M).** Ore carriers.
- Carpentero (S-M).** A carpenter.
- Carretilla de Mano (S-M).** A wheelbarrow.
- Carreta (S-M).** A wagon or cart.
- Carretero (S-M).** A wagoner.
- Casa de Moneda (S-M).** The mint.
- Cascajal (S-M).** A gravel pit.
- Cascajo (S-M).** Gravel; rubbish.
- Casco (S-M).** A boiler used in hot amalgamation.
- Castina (S-M).** Fluor or flux.
- Castido (S-M).** The frame of the stamping machine.
- Catear (S-M).** To search for new mines; a prospector.
- Cajoneros (S-M).** Landers at the mouth of a shaft.
- Caja (S-M).** Money chest; treasure.
- Cebar (S-M).** To feed or supply a furnace with materials for smelting; add quicksilver, etc.

- Cebo (S-M). A feed for an animal; priming a blast; adding the second lot of quicksilver to the torta.
- Cedazos (S-M). Sieves.
- Cerro (S-M). A mountain.
- Cestas (S-M). Baskets.
- Char (E-C). To work by the day.
- Cheek (E-C). The side wall of a vein.
- Cheeks (E-C). The edges of the crossheads in front of the guides of an engine.
- Chimney (A). A chimney-shaped body of ore, generally perpendicular.
- Chispa (S-M). A precious gem of much beauty.
- Chloride (L). A compound of chlorine and silver.
- Chute (A). A incline channel through which the ore slides.
- Cinnabar (L). Sulphide of mercury, or ore in which quicksilver is found.
- Clack (E-C). The valve of a pump.
- Claim (A). A piece of land 25 to 300 feet wide and 1,500 feet long, which the government sells to the person who finds mineral within its limits.
- Claro (S-M). An open space on the lode, from which ore has been taken.
- Cleavage (A). Is the tendency of crystals, rocks or ore to split in certain directions, but not in others.
- Clean-up (A). Collecting the gold from the flume or arrastra, in placer mining.
- Chlorides (A). A combination of chlorine and silver or other metals.
- Cliff (A). A steep, rocky ridge; a precipice.
- Coaster (E-C). One who picks ore from the dump or abandoned mines.
- Cob (E-C). Breaking the ores, in order to separate the good from the worthless.
- Cobalt (A). A brittle, reddish-gray metal.
- Cobre (S-M). Copper.
- Cobrizo (S-M). Inferior copper ore.
- Cojete (S-M). A cartridge for blasting.

- Cofferdam (A).** A box of timber or lumber made water-tight, placed in the bed of a river.
- Collado (S-M).** A hill.
- Collar of a Shaft (A).** The timber by which its upper parts are kept from falling together.
- Color (A).** Particles of gold in the pan in placer mining. If gold is found in the pan, "color" is found.
- Colorados (S-M).** Ores showing a coloring of red oxide of iron.
- Comb (A).** One of the layers of a banded vein studded with crystals.
- Comillo (S-M).** A reverberatory furnace.
- Cement (A).** Tough, compact gravel, gold-bearing.
- Commix (L).** To unite in one mass.
- Compact (A).** A body that can not be split.
- Compromiso (S-M).** A private or joint stock undertaking.
- Concrete (L).** A mixture of lime, sand and gravel, which dries in a solid mass.
- Conducta (S-M).** An escort for a caravan transporting precious metals, etc.
- Conduit (F).** A canal, ditch or water pipe for conducting fluids.
- Conflux (L).** A junction of currents.
- Conglomerate (L).** Pudding stone composed of gravel and pebbles connected together.
- Contact (A).** A touching, meeting or junction of two different kinds of rock, as porphyry and slate.
- Contiguous (A).** In close or actual contact.
- Convenio (S-M).** A legal agreement.
- Copper (L).** A reddish mineral, in much demand.
- Copola (S-M).** A cupelling furnace.
- Corral (S-M).** A strong pen or stockade for keeping cattle.
- Cord of Ore (E-C).** One hundred and twenty-eight cubic feet of broken ore; about seven tons in quartz rock.

Core (A). Miners usually work but six hours at a time. The "forenoon core" is from 6 a. m. to noon; the "afternoon core" from noon to 6 p. m.; "night core" from 6 p. m. to midnight; "last core" from midnight to 6 a. m.; four *shifts*.

Cortar las Sorgas (S-M). To cut the ropes; abandon a mine.

Corundum (L). The hardest known substance, next to the diamond.

Costeaning (E-C). Discovering lodes by sinking pits in their vicinity, and driving transversely in their supposed direction.

Cortadores (S-M). Wood choppers.

Counter mine (A). A gallery excavated to frustrate the use of another; to defeat secretly; a plot against a plot.

Country (A). The ground traversed by a vein.

Country Rock (A). The strata or rock through which the vein or lode traverses, usually valueless.

Coyoting (A). Irregular hunting for surface mines.

Cradle (A). A rocking contrivance for washing gold in placers.

Crater (A). The mouth of a volcano.

Creston (S-M). Outcroppings of a lode; a vein of ore showing on the surface.

Crevice (A). A narrow opening, resulting from a split or crack; a fissure.

Criadero (S-M). A locality where ores are thought to abound.

Crib, or Curb (A). A circular frame of wood screwed together, as a foundation for bucking or pulverizing ore in a shaft.

Criba (S-M). Perforated leather, through which the crushed ore falls into a receiver.

Cribbing (A). A timber or plank lining for a shaft; the confining of a wall-rock.

Croppings (A). The rock that appears on the surface, indicating the presence of mineral.

Cross Course (A). A lode or vein which intersects or crosses a lode at various angles, and generally throws the main lode out of its regular course.

Crosscut (A). A level driven at right angles to the direction of the lode.

Cruces (S-M). A crosspiece of the arrastras or grinding mills.

Crucero (S-M). A crosscut.

Crushing (A). Grinding or pulverizing the ores without water.

Cube (L). A body having six equal sides.

Cubo (S-M). A bucket.

Cuchara (S-M). A spoon or scraper used in blasting to remove the pulverized rock.

Crucible (L). A pot used for melting mineral.

Cueros (S-M). Skins of oxen, horses or cows.

Cuerdo (S-M). A rope.

Cuna (S-M). A wedge.

Cupel (L). A small bone-ash cup used by assayers.

Cupriferous (L). Containing copper.

Cut (A). To intersect by driving, sinking or raising.

Cyanide (G). A process of gold extraction.

D

Dagh (E-C). Hill; mountain.

Dead Ground (A). A portion of the lode where there is no ore.

Dean (E-C). The end of a level or crosscut.

✓ Debris (F). Sediment from mines, or mountain washings.

Dendritical (L). Silver appearing like tree branches.

Denudation (A). Rocks laid bare by running water, or other agencies.

Deposit (A). Ore not confined to a lode.

Denouncement (S-M). Spanish for location and record of a claim.

Derecho (S-M). Right; straight.

Desagues (S-M). Outlet of any description by which water is got rid of in a mine.

Despensa (S-M). A storeroom for materials, tools, bullion, etc.

Destajo (S-M). Piece or contract work; tut-work.

Despueble (S-M). Failing to do the necessary work to hold a claim; abandoning the mine.

Detritus (L). Waste rock; surfaces.

Denucio (S-M). Denunciation; a formal application to the court of law to have a mine adjudged to the applicant for reasons of its not having been worked in accordance with the law, or its having been abandoned.

Diggings (A). Name applied to placers being worked.

Dike (A). A wall of rock or mineral thrown upwards; an intrusion of mineral melted matter into rents or fissures of rocks.

Diluvium (L). A deposit of superficial sand, loam, pebbles, gravel, etc.

Dip (A). The slope, pitch or angle which a vein makes with the plane of the horizon.

- Disintegrated (A).** Rock decomposed by atmospheric, aqueous and other agencies, reduced to sands, gravel, etc.
- Disseminated (A).** Where the mineral is distributed through the veinstones.
- Divining Rod (A).** A method of prospecting for water or mineral by a stick of witch-hazel. The old prophet, Moses, made a big strike with his rod, but we fear it is now one of the lost arts.
- Dolomite (L).** A crystalline magnesian carbonate of lime.
- Dowsing Rod (E-C).** The hazel rod of divination, by which some persons pretend to discover lodes.
- Downcast (A).** A shaft for ventilation by a descending current of air.
- Dressers (A).** Cleaners of ores.
- Drift (A).** The excavation made for a road underground.
- Driving (A).** Digging horizontally.
- Droppers (E-C).** A branch when it leaves the main lode.
- Ductile (L).** A mineral that is malleable and can be drawn out into wire or sheets.
- Dump (A).** The pile of ore or debris taken from mines, or tailings from sluicing.
- Durns (E-C).** A frame of timber with boards placed behind it to keep open the ground in shafts, tunnels, levels, etc.

E

- Ecurie (F). A stable.
- El Dorado (S-M). Supposed to be a land of boundless wealth.
- Elvan (E-C). Porphyry, stone, clay, etc.
- Embolo (S-M). A piston.
- En Bonanza (S-M). Yielding rich returns.
- End Lines (E-C). The lines bounding the ends of a claim.
- Energy (A). Activity, work, vigor, etc.
- Ensaajo (S-M). A trial.
- Ensaye (S-M). Assayer.
- Ensaye (S-M). Assay.
- Erosion (G). A valley, formed gradually by water; a wearing away.
- Escaleras (S-M). Ladders made of poles, with notches cut in them for steps.
- Esmeralda (S-M). Emerald.
- Esmariel (S-M). Blende.
- Esmeril (S-M). Emery.
- Espato (S-M). Spar.
- Espato Fluor (S-M). Fluor spar.
- Espato Calizo (S-M). Calcareous spar.
- Espejuelo (S-M). Mica.
- Espeque (S-M). A lever.
- Estaca (S-M). A stake.
- Estado (S-M). A statement of account.
- Estano (S-M). Tin.
- Estaniqué (S-M). Pond; dam of water.
- Estoraque (S-M). Brown blende, sulphureted zinc.
- Eureka (G). Any discovery. I have found it.
- Eye (E-C). Top of a shaft.
- Exploitation (S-M). The working of a mine; the amount of work done.

F

Face (A). End of level or tunnel against the ore or rock.

Face Workings (A). The portion of the mine seam which is in process of removal.

Factor (S-M). An agent for a principal.

Fancy Stocks (A). Stocks of well known intrinsic value.

Faenas (S-M). Common work.

Fanegado (S-M). Nine-tenths of an English acre.

Fanega (S-M). A dry measure of twelve celemins, or 1.599 of an English bushel.

Fathom (E-C). Six feet square on the vein.

Fault (A). The displacement of a lode by a cross vein.

Feeder (A). A branch when it falls into the lode, and joins a larger one.

Feldspato (S-M). Feldspar.

Feet (A). Flanges by which an engine is tied.

Feldspar (L). A very abundant mineral; silicate of alumina, with soda, potash, lime; of various colors.

Ferruginous (L). Containing or partaking of iron.

Filiform (L). Mineral of a thread-like form.

Fissure Vein (A). A fissure or crack in the earth's crust, filled with mineral matter. The two walls are always of the same geological formation.

Fire Clay (A). A nearly pure silicate of alumina, able to retain its form against a great degree of heat.

Flang (A). A two-pointed pick.

Flete (S-M). Freight.

Float (A). Loose rock or isolated masses of ore, or ore detached from the original formation.

Fluor Spar (A). Useful as a flux in fusing iron ore.

Flume (A). Boxing or piping for conveying water.

Fluccan (L). A half decomposed rock often found adjoining a vein.

Floride (L). A combination of florine with a metal.

Flux (A). The flow of the ore in the furnace of the smelter. To "flux" mineral is to get it so it will melt and run. It is obtained by adding to the ore certain proportions of other minerals, as of coke, coal or iron.

Flookan (E-C). A cross vein composed of clay.

Flujo (S-M). Flux.

Fondon (S-M). A furnace for smelting ores.

Foot Wall (A). The layer of rock immediately under the vein.

Forfeiture (A). A failure to comply with the laws prescribing the quantity of work.

Fosforo (S-M). Phosphorus.

Fosiles (S-M). Fossils.

Fossils (L). Various petrifications; organic remains.

Fragua (S-M). Forge.

Free Gold (A). Gold easily separated from the quartz or dirt.

Frente (S-M). An extremity; an end.

Frijoles (S-M). French beans; common food in some parts of the country.

Frutos (S-M). Product, ore, mineral.

Fuellos (S-M). A bellows.

Fundicion (S-M). Smelting; smelting house.

Funditor (S-M). A founder; a smelter.

G

Gad (E-C). A slim, pointed iron wedge to break away rock or mineral.

Galena (A). Lead ore; sulphur and lead.

Golpeador (S-M). A miner who works with the hammer or mallet in blasting.

Galvanized Iron (A). Iron coated with zinc.

Gamela (S-M). A large wooden bowl.

Gangue (A). The substance inclosing and accompanying the ore in a vein.

Garnet (L). A common mineral in some metamorphic rock. There are many varieties.

Gash Vein (E-C). A vein wide above and narrow below.

German Silver (A). An alloy of copper, zinc and nickel.

Geode (G). A cavity studded around with crystals or mineral matter; a rounded stone containing such a cavity.

Glacier (F). A stream of ice, which moves slowly down a mountain, and is continually fed from the snow fields above.

Glist (E-C). Mica.

Glossary (G). Vocabulary for explaining the contents of this book.

Gneiss (D). Stratified rock, similar to some kinds of granite.

Gossip (A). A person fond of telling tales; a rubber-tongue.

Gouge (E-C). A clay streak found next to a fissure vein; a slip of ore vein.

Granos de Oro (S-M). Grains of gold.

Graphite (G). Black lead.

Granzas (S-M). Poor ores.

Grano (S-M). A grain.

Granada (S-M). Garnet.

- Granitoid (G).** Resembling granite.
- Granito (S-M).** Granite.
- Grasas (S-M).** Slag from the smelting furnace.
- Grass-Roots (A).** Starting work from the surface—
from the “grass-roots.”
- Gravel (F).** Fine stones.
- Gravity (A).** The tendency which all bodies in nature have to approach each other.
- Graystone (A).** Trachyte.
- Greda (S-M).** Chalk.
- Greta (S-M).** Litharge; fuller’s earth.
- Grizzley (A).** Bars set in a flume to strain out the large stones used in hydraulic mining.
- Grub Pile (A).** Meal time; a meal waiting to be eaten.
- Grubstake (A).** One party furnishing provisions and tools and the other doing the prospecting—divide “share and share alike.”
- Guixa (S-M).** Quartz.
- Gulch (A).** A ravine.
- Gulcinum (L).** A metal in form of a grayish-black powder, which shows dark metallic luster by rubbing.
- Gulph of Ore (E-C).** A very large deposit of ore in a lode.
- Gun Metal (A).** An alloy of nine parts of copper and one of tin.
- Gurt (E-C).** A channel for water; a gutter.
- Gypsum (G).** A native sulphate of iron.
- Gypsiferious (G).** Of the nature of gypsum; plaster of paris; sulphate of lime.

H

- Hacienda (S-M). Farm; estate; works for reducing ore.
- Hachas (S-M). Hatchets; axes.
- Hanging Wall (A). The layer of rock or wall over a lode.
- Hard Carbonate (A). Carbonate ore so hard that it has to be blasted out, or picked out with much difficulty.
- Head (A). The circular plates that cover the cylinder of a steam engine.
- Heading (A). The vein above the drift.
- Headings (A). In placer mining, the mass or gravel above the head of sluice.
- Heave (E-C). Dislocation of one ore lode by another, horizontally.
- Heel'd (E-C). To be; to be armed.
- Hechado (S-M). Dip of the lode.
- Hematite (G). An iron ore.
- Hiatus (L). A chasm; a gap.
- Hierro Labrado (S-M). Wrought iron.
- Hierro Colado (S-M). Cast iron.
- Hierro (S-M). Iron.
- High Explosives (A). Those of greater force than black powder.
- High Grade Ore (A). See low grade ore.
- Hilo (S-M). A small vein or thread of ore in a lode.
- Hilo de la Veta (S-M). Line or direction of the vein.
- Hogback (A). An almost perpendicular ridge of rocks.
- Hoja de Lata (S-M). Tin plate.
- Hajo de Laton (S-M). Sheet brass.
- Horno (S-M). A furnace.
- Horno de Magistral (S-M). Roasting stove for copper pyrites.

Hornblende (E-C). A silicate of lime, magnesia, iron and manganese, found in metamorphic rock.

Hornstone (E-C). A variety of compact quartz, horn-like as to appearance.

Horse (E-C). A mass of rock matter occurring in or between the branches of a vein.

Horsepower (A). A power of a horse, or its equivalent; power which will raise 33,000 pounds avoirdupois one foot per minute; used to express the power of a steam engine.

Hot Blast (A). A current of heated air driven by blowers in a furnace.

Huaco (S-M). A hollow.

Hudge (E-C). A metal bucket used for hoisting.

Hungry (E-C). Valueless ore; barren.

Hyacinth (G). A red ferruginous quartz, of a blood-red color, sometimes of a reddish-orange, also brown.

Hydraulic Mining (A). See, in back of book, "Miscellaneous Memorandums."

I

Iceland Spar (E-C). Most transparent variety of calcspar, found in large crystalline masses in trap-rock.

Inch of Water (A). About two and a half cubic feet per minute; the water that will run out of an opening one inch square, or section under head of six inches.

Impetus (A). The effect produced by a moving body.

Incline (A). A slanting shaft.

Indian Rubber (A). Caoutchouc, the native article, is an inhuman production; a gossiping tongue.

Indurated (L). Any substance becoming hardened.

Ingenios (S-M). Engines.

Igneous (L). Rocks whose structure is attributable to heat, such as porphyry, etc.

Ingot (E-C). A mass of gold, silver or other minerals cast in a mold.

In Place (A). A mineral is "in place" when it is where it geologically belongs. Mineral in the carbonate vein is "in place," but mineral found lying loose on the mountain side, in large rocks, for example, or lodged in the porphyry under ground, is not "in place." A man may strike mineral, but if it is not "in place" he is apt to be deceived as to the extent of his discovery.

Insolido (E-C). In the whole of a joint contract.

Instrumentos (S-M). Tools; instruments.

Intendente (S-M). Intendent.

Interventor (S-M). Inspector; one who looks after the interests of mine owners, etc.

Intersect (A). To meet a cut mutually; side of lines.

Intrusive Rock (E-C). Rocks which have thrust themselves in sheet-like masses, vertical, oblique or flat, through or between sedimentary strata, affecting them on both sides, or above and beneath.

Iridium (L). A rare white metal, generally associated with osmium in connection with platinum.

Iron Hat (A). Iron coloring in the outcrop of a lode.

Ironstone (E-C). Highly ferruginous sandstone, abundant in clay, associated with vegetable remains, as in coal measures.

J

Jaspe (S-M). Jasper.

Jasper (S-M). An amorphous silica, red, brown, yellow, green, often banded, the result of igneous and hydrothermal action of clays.

Jig (A). A contrivance for concentrating ores by sieves.

Jaws (E-C). The part of the crosshead which rests on the guide. There are upper and lower "jaws."

Jigger (E-C). Cleaner of ores.

Jigging (E-C). Separating ores with a sieve.

Jorango (S-M). A small basket, or blanket.

Jornaleros (S-M). Day laborers.

Jumper (A). A long lever worked by one person.

Jumping a Claim (A). Relocating a claim on which the required work has been done; endeavoring to obtain possession of the claim, or land, which has been taken up and occupied by another.

K

Kames (G). Ridges of post-glacial gravel and sand at end of valley, like embankments.

Kaoline (G). Porcelain clay; a dull, opaque clay, of various shades of white, arising from decomposition of feldspar.

Keesh (E-C). Flakes of carburet of iron on the surface of pig iron.

Keil (E-C). A deep red peroxide of iron, used for marking.

Kibble (E-C). A Cornish bucket for ore hoisting.

Kimeridge Clay (E-C). A fossiliferous clay, containing a bituminous shale called "kim coal."

L

Lagging (E-C). The timbers over and on the side of a drift.

Ladrillera (S-M). An iron or stone mold for melting silver, to form the barra.

Ladrillas (S-M). Bricks.

Lancha (S-M). A sort of hard freestone.

Lapiz (S-M). Black lead.

Lapiz Encarmado (S-M). Red chalk.

Lariat (S-M). A rope made with thongs of rawhide, twisted or braided; a strong hemp rope, used for catching and picketing wild cattle and horses. It is also called "lasso."

Lamine (L). Thin sheets or scales of a mineral.

La Plata (S-M). Silver.

Laterite (L). Disintegrated gneiss, generally red, indurated, reddish clayish alluvium.

Laton (S-M). Brass.

Latten (E-C). Sheet brass; thin iron plates coated with tin.

- Lava (L).** Rock material which flows, melted from volcanoes; pumice; black lava.
- La Veta (S-M).** The lode or lead.
- Layer (A).** Stratum; bed; undergrown rock.
- Lazadores (S-M).** Procurers of men to work in mines, drive cattle, etc.
- Lead (E-C).** White lead is carbonate of lead, a common pigment. Red lead is a compound of oxide and dioxide of lead. Sugar of lead is acetate of lead.
- Ledge (A).** A lode or vein.
- Lena (S-M).** Firewood.
- Level (A).** A tunnel cut on the vein from main tunnel; a drift.
- Lift (E-C).** Space between levels.
- Lignite (L).** Wood coal; brown coal; wood fossilized, not so far converted into coal as to lose its woody texture; burns with a disagreeable odor.
- Limestone (A).** All rocks of which the base is carbonate of lime.
- Litharge (G).** A brown-red oxide of lead.
- Lithium (G).** A white metal, the lightest known.
- Libranza (S-M).** A bill of exchange.
- Ligra (S-M).** Flux.
- Little Giant (A).** A movable nozzle attached to hydraulic pipes.
- Lixiviation (L).** A leaching process, by which alkali or saline matter is extracted from ores; leaching.
- Llano (S-M).** A plain; flat ground.
- Llerada (S-M).** Carriage; transport.
- Llerador (S-M).** Carrier; conductor.
- Loadstone (A).** An iron ore; a native magnet.
- Locate (A).** To establish the possessory right to a mining claim, the property secured being designated "claim" or "location."
- Lodo (S-M).** Mud.

Lode (A). Any zone or belt of mineralized rock lying within the boundaries clearly separating it from the neighboring rock. It includes all deposits of mineral found through a mineralized zone or belt, coming from the same source, impressed with the same forms, and appearing to have been created by the same process.

Loma (S-M). Small table-lands on both sides of a river.

Long Tom (E-C). A long trough or flume of lumber, with riffles for catching the gold; a running stream of water through the flume, in which is shoveled the mineral-bearing dirt.

Losa (S-M). A flat stone.

Lost Levels (A). Levels which are not driven horizontally.

Luck of Roaring Camp (A). Bret Harte's girl baby.

Low Grade Ore (A). Ore which runs below twenty ounces of silver to the ton, fifty per cent. of the ton being lead. Ore which runs more silver, with fifty or more per cent. of lead, is "high grade" ore, yet a high per cent. of lead is necessary to make it high grade ore. For example, ore with one hundred ounces of silver to the ton, but with no lead, would rank low grade, as the smelting would cost so much as to leave little profit to the miner.

Lumbrecera (S-M). An air shaft; an adit shaft.

M

- Macizo (S-M). A solid, untouched part of the vein.
- Madera (S-M). Timber.
- Magnet (L). A loadstone; an ore that attracts iron.
- Malacate (S-M). A horse whim.
- Malacatero (S-M). A whim driver.
- Malachite (G). A beautiful copper ore, usually green.
- Malleable (L). Capable of being spread out by hammering.
- Manganese (L). A metal of whitish-gray color to a dusky white, very hard and difficult to fuse.
- Manantial (S-M). A spring of water.
- Mandon (S-M). Overseer; the boss.
- Mandadero (S-M). Errand boy.
- Manhole (A). A passageway between levels on workings.
- Manta (S-M). A blanket; horse cloth; ox hides used to transport ores.
- Manto (S-M). A bed, or circumscribed stratum.
- Marble (G). A limestone that will receive a fine polish, usually metamorphite.
- Marco (S-M). Eight ounces; equal to 3,552 grains, English.
- Marmol (S-M). Marble.
- Marl (E-C). A species of earth.
- Maquina (S-M). A machine.
- Maquinas de Vapor (S-M). Steam engine.
- Matrix (L). The vein ore found enclosed by barren rock or earth matter.
- Martriquila (S-M). A register for mines, etc.
- Maroma (S-M). A drag rope; hawser.
- Martillo (S-M). A hammer.
- Matte (D). Crude black copper, reduced but not purified from sulphur.

Maza (S-M). Stamp head; weight for pulverizing ores.

Meat Earth (E-C). The vegetable mold.

Mecha (S-M). A match or fuse.

Mechanical Powers (A). The lever, incline plane, pulley, screw, wedge, wheel, and axle.

Medida (S-M). A measure.

Mejora (S-M). Improvement.

Mesa (S-M). High table-land.

Meson (S-M). A common inn, mostly frequented by muleteers.

Mercury (G). Quicksilver, a bright, white metal.

Metal (A). Fusible substance by heat—iron, gold, silver, etc.

Metallurgy (L). The science of testing, assaying or separating the metals from the ores.

Metals Flomas (E-C). Ores impregnated with lead.

Meteoric Iron (G). Metallic iron, as found in meteorolites.

Mill Run (A). A test of quality of ore after reduction.

Mill Hole (A). A hole in stall to pass down rock or mineral.

Mica (L). A mineral which cleaves in thin, transparent sheets.

Millrind (E-C). The iron placed in the center of a millstone to protect the hole from wearing out.

Mine (A). A place where minerals are dug; a vein of ore.

Miner's Inch (of water). See "Miscellaneous."

Mine Expert (A). A person well versed in mines and mineralogy; often one, when sent by a capitalist—prospective purchaser—to examine and report on the value of a mine, reports favorable for the party paying the most money.

Mineral (A). A substance not organic, existing on or in the earth, impregnated with mineral substances.

Miscellaneous. See in back of book.

- Mock Lead (E-C). Blende.
- Modelos (S-M). Models.
- Mojon (S-M). A landmark used to indicate boundaries.
- Monteros (S-M). A mountain man.
- Montes (S-M). Foothills.
- Monton (S-M). A quantity of ore; a batch under the process of amalgamation.
- Moorstone (E-C). Granite.
- Moraine (F). Masses of rock and rubbish brought by glaciers down from the mountains.
- Mosaic Gold (A). Bisulphite of tin; a gold-colored powder, or an alloy of equal parts of copper and zinc.
- Moyle (E-C). A drill for cutting ditches.
- Mozo (S-M). A manservant.
- Muestra (S-M). Samples.
- Muleteer (E-C). A driver of mules.
- Mule Drivers (A). "Mule skimmers."
- Mun (E-C). Any fusible metal.
- Mundice (L). Iron pyrites.

N

Natron (G). Native carbonate of soda.

Nicolo (S-M). Nickel.

Nickel (A). A brilliant white metal, strongly magnetic; base copper.

Nigger-Ashlar (E-C). A mode of dressing stone, in which the face is left rough.

Nitro (G). Niter.

Nivel (S-M). Level.

Nodules (L). A rounded mineral mass of irregular shape.

Nogo, or Nays (E-C). Supports for the roof of a mine.

No Sabe (Savvey) (S-M). Don't understand.

Noria (S-M). An endless chain, with buckets, for drawing water.

Nuggets (A). Large lumps of gold found in gold placer diggings; are water-worn.

O

Obsidian (L). A native glass, volcanic, more or less feldspathic, of various colors.

Ochres (G). Clays colored with oxide of iron.

Opal (L). A stone of changeable color.

Open Cut (A). Not covered; working from the surface.

Operator (A). Working a mine as owner or lessee.

Onyx (G). A precious stone; many colors.

Ore (E-C). A native mineral; metal.

Ore Drag (E-C). A drag made of green oxhides for bringing ore down the mountains on snow. The ore is sewed up in sacks of 100 pounds each, then placed on the hide, which has loops around the edge, and when the desired number of sacks are in position a rope is run through the loops and drawn taut, with the hair of the skin outwards. A brake of iron, in the shape of a horseshoe, with teeth that drag through the snow to hold back, is hitched to the tail of the hide and a mule to the head. The driver stands on the hide, but when the grade is too heavy he stands on the horseshoe, his weight regulating the speed.

Ore Reserves (A). Ore bodies left for shipping.

Outcrop (A). That portion of a vein appearing on the surface.

Outfit (A). Tools, etc., needed in the business; provisions, etc.

Output (A). The total product of a mine.

Oxide (G). A compound of oxygen with any other single element.

P

Pacos (S-M). Earthy ores; oxide of iron, mixed with various ores of silver.

Paito (S-M). A space where ore is trodden by horses or mules, for mixing and amalgamating.

Paja (S-M). Straw.

Pala (S-M). A wooden shovel.

Palanca (S-M). A lever.

Palmo (S-M). Spanish yard.

Panizo (S-M). Hornstone.

Pan, or Panning (A). To wash the dirt from the free gold with a pan. The pan is similar to the ordinary milk pan, of sheet iron.

Parado (S-M). A relief, or change of men, horses or mules; a shift.

Parcinera (S-M). A partner.

Pare (S-M). Gang or party of men.

Parihuela (S-M). A letter.

Pard (A). An abbreviation of partner.

Peso (S-M). A dollar.

Patch (E-C). A small placer claim.

Peacock Ore (A). Ore or mineral of beautiful color.

Pay Dirt (A). Auriferous earth, rich enough to pay the cost of extracting the metal.

Pay Streak (A). That seam in crevice containing the mineral.

Pay Rock (A). Rock quartz that will pay for mining.

Pearl Spar (A). Brown spar; a magnesian carbonate of lime, colored by the oxide of lime or manganese.

Pegador (S-M). Men who light the fuse or matches in blasting.

Pella (S-M). Silver, when all the quicksilver has been pressed out, except that portion which can only be separated by distillation.

Peltre (S-M). Pewter.

Peones (S-M). Native laborers, who are held in bondage for debts they are working out.

Pepenado (S-M). Cleaned ore.

Pepenadores (S-M). Cleaners, cobbers and classers of the ores.

Peritos (S-M). Practical persons selected for arbitrators to decide questions of right, in cases of disputes.

Petering (A). Ore giving out; "petering out."

Pez (S-M). Pitch.

Piazza (I). Slate.

Pico (S-M). A miner's pick.

Piedra Iman (S-M). Loadstone.

Piedra (S-M). Stone.

Piedra Podrida (S-M). Rotten stone.

Piedra Cornea (S-M). Hornstone.

Piedra Pomez (S-M). Pumice stone.

Pig (A). Metal extracted from the ore.

Pilgrim (E-C). Fresh arrivals from foreign parts; a greenhorn, tenderfoot, etc.

Pina (S-M). Amalgam.

Pinch-out (A). An ore vein lost by the coming together of the wall rock on each side of it; "pinching the vein."

Piping (A). A term used in hydraulic mining; discharging water through a hose nozzle.

Pit (A). A superficial shaft.

Pitch (A). The dip of the ore vein.

Pyrites (L). Sulphuret of iron.

Placer (S-M). A gravelly place where gold is found.

Plancha (S-M). Pigs of lead.

Plant (A). Manufacturing works of all kinds, railroad companies, machinery, tools, etc.

Plata (S-M). Silver.

Platinum (A). A grayish-white metal.

Pleito (S-M). A lawsuit.

Plomo (S-M). Lead.

Plumbago (L). Black lead; a form of carbon.

Pocket (A). A rich spot in a vein or deposit; sometimes a mine contains only a few pockets of paying mineral, then the mine is called a "pocket mine."

Polvora (S-M). Gunpowder.

Polvo (S-M). Dust.

Polvillones (S-M). Rich ores.

Poncho (S-M). A cloak worn by Spanish-Americans, like a blanket, having in the middle a hole for the head.

Pone (A). Indian meal made into dough and baked.

Porfido (S-M). Porphyry.

Porphyry (G). A rock consisting of a compact base, through which crystals of feldspar are disseminated.

Precipitated (A). Cast or thrown down as a sediment.

Presa (S-M). A dam.

Primary Rock (E-C). Consists of the various kinds of quartz, slate, granite, serpentine and gneiss.

Prime Movers (A). Water wheels, steam engines, windmills, etc.

Prince Metal (E-C). An alloy, composed of three parts of copper to one of zinc, in imitation of gold.

Prit (E-C). A solid piece of virgin metal, or the button from an assay.

Promoter (A). One who makes a business of selling property.

Prospect (A). Indications of rich mineral; a vein of ore that has the appearance of containing minerals that are valuable; they may be of any kind—gold, silver, copper, etc.

Prospecting (A). Is hunting for mineral lodes, placers, or other valuables, on the plains or in the mountains.

Protocola (S-M). Minutes.

Pudding Stone (A). A coarse sandstone, composed of pebbles; flints cemented together.

Puddling (A). Melting cast iron in a reverberatory furnace and stirring it, to get rid of the carbon in making wrought iron.

Pulgada (S-M). An inch.

Pulp (A). Pulverized ore in the lixiviation process.

Pulque (S-M). Wine made from aloes; the common drink in Mexico.

Pulverize (A). To reduce to powder.

Pyrites (L). A combination of sulphur with iron, copper, cobalt, or nickel.

Q

Quartz (L). A mineral composed of pure silica; rock crystal.

Quartzite (E-C). A granular variety of quartz; sandstones altered by pressure and heat assume the aspect of quartz; metamorphic.

Queen's Metal (E-C). An alloy of nine parts of tin and one of antimony, of bismuth and of lead.

Quien Sabe (Kin Savvey) (S-M). Who knows? or, Do you understand?

Quicksand (A). Unsolid sand, mixed with water; such as will not support a man's weight.

R

Raise (A). A winze shaft worked from below.

Ravine (L). Long hollow between hills.

Reducing (A). Separating from foreign substances; the reduction of ores consists in extracting from them the metals they contain.

Reef (A). A lode or ledge.

Refractory Ore (A). Ore of difficult reduction or extraction.

Reniform (L). A kidney-shaped ore.

Reticulated (A). Ore resembling network.

Riffles (A). Cross slats in a sluice, a few inches apart, where the gold settles.

Roasting (A). Heating the ore so as to drive off the volatile parts, the sulphur.

Rocker (A). A cradle-shaped device for washing ores.

Rock Oil (E-C). Petroleum oil.

Rock Salt (E-C). Common salt; chloride of sodium in rock masses.

Roe Stone (E-C). Oolite.

Roof (E-C). A rock stratum over the vein.

Royalty (A). The profit in leasing a mine.

Ruse Contre Ruse (F). Trick for trick; diamond cut diamond.

S

- Sable Iron (E-C).** A superior kind of Russian iron.
- Saca (S-M).** The ore obtained from a mine in a given length of time.
- Sala (S-M).** The principal room of a hacienda or any other building.
- Salitre (S-M).** Saltpeter.
- Sal Mineral (S-M).** Mineral salt for amalgamation.
- Sal (S-M).** Salt.
- Salting a Mine (A).** Placing mineral or ore in barren places to swindle.
- Sandstone (A).** A stone composed of grains of quartz.
- Sapphire (G).** A precious stone.
- Sardonyx (G).** A precious stone of a reddish-yellow color.
- Scarp (E-C).** The interior slope of a ditch.
- Schist (G).** Rocks having a slaty structure; fissile rocks; mica schist.
- Schlich (E-C).** The ore of a metal, especially gold, pulverized and prepared for further working.
- Seam (A).** A bed, as distinguished from a vein.
- Seam (E-C).** A horse load.
- Scovan Lode (E-C).** A lode having no oxide of iron and quartz on its back or near the surface.
- Sebo (S-M).** Tallow or suet used for machinery, etc.
- Selvage (E-C).** A thin band of earth matter between the walls and vein.
- Serape (S-M).** The blanket dress of miners.
- Shaft (A).** A vertical or inclined excavation for the purpose of prospecting or working mines.
- Shelf (A).** The firm rock.
- Sheave (E-C).** The pulley over which the whim rope passes.
- Shift (A).** Changing one set of miners for another; six and eight-hour shifts.

Sicca (E-C). Rupee.

Side Lines (A). The lines which bound the sides of a claim.

Sierras (S-M). Saws; a chain of mountains.

Silex (L). The earth of flints; the characteristic of rock crystal; quartz and flint.

Silica (L). A pure silex.

Silla (S-M). A kind of saddle, which passes over men's shoulders to protect them in carrying ores, usually leather.

Silver Glance (A). A silver ore; when pure, carries eighty-seven per cent. of silver and thirteen per cent. sulphur.

Slag (A). Scum, dross, the excrement of a metal; vitrified cinders; waste from smelters.

Skip (E-C). A hoisting bucket running on grooves, guides or cables.

Slag (A). Dross of metals.

Slate (A). A rock that can be split in thin plates.

Slide (E-C). A vein of clay, which, intersecting a lode, occasions a vertical dislocation.

Slide (A). A mass of loose rock enveloping either lode or country.

Slickenside (E-C). A smooth, polished surface or wall, caused by friction.

Slimes (A). Mud containing metallic ore.

Slimes (A). The finest of the crushed ore and gangue from mills.

Slope (A). Driving an incline on the ore vein.

Sluices (A). Boxes or troughs through which gold-bearing gravel is washed.

Smelting (A). Reducing the ore in furnaces to metals.

Sobranite (S-M). Profits; surplus residue after expenses.

Soft Carbonate (A). Silver-bearing mineral so soft that it can be readily taken out with a pick and shovel. It is usually sand impregnated with mineral, the mineral having been carbonated and oxidized. Soft carbonates are usually richer in silver than hard carbonates.

- Sollar (S-M).** A small platform at the end of a certain number of ladders.
- Solvent (A).** A fluid which dissolves various substances.
- Soplete (S-M).** A blowpipe.
- Sowbelly (A).** Bacon; hog sides.
- Spalling (E-C).** Baking the ore into small pieces.
- Specimen (A).** A sample of anything, ore, etc.
- Spur (A).** Range of hills or mountains jutting out at right angles to the principal range.
- Stalactite (L).** A cone of carbonate of lime, hanging like an icicle in a cavern; dripping of water from a roof of carbonate of lime.
- Stamps (A).** A weighted vertical shaft, operated by cam machinery, for crushing ores.
- Strata (L).** A series of beds of rock.
- Stream Tin (E-C).** Tin ore found in the form of pebbles.
- Streamers (E-C).** Persons who work in search of stream tin.
- Stope (A).** A body or column of mineral left by running drifts about it.
- Stoping (A).** The act of breaking down a stope and excavating it with a pick.
- Strike (A).** A find; a valuable mineral development made in an unexpected manner.
- Stull (E-C).** Platforms of timbers between levels for strengthening the mine by supporting the walls, and for storing ore and depositing wall rock and waste material upon.
- Stull Timbers (E-C).** The large timbers placed across the vein or lode from one wall to another to support the lagging upon which the ore or waste is placed.
- Substratum (L).** A stratum under something; rock or earth.
- Sucino (S-M).** Amber.
- Sulphur (L).** An inflammable yellow mineral; brimstone.

Sump (E-C). A pit; the bottom of the engine shaft; a place for collecting water.

Superficial Deposits (A). Are composed of such metals and ores as lie on or near the surface, intermixed with soil, sand, gravel, etc.; they are also called washings or stream works, these metals and ores being gathered by washing with water; much gold, all platina, and some tin and cinnabar are collected in this manner.

Sulphuret (L). Combination of sulphur with a metallic, earthy or alkaline base.

Sylvanite (L). A combination of gold, silver and tellurium, in fine gray and silver crystals.

Syenite (L). A rock resembling granite.

T

- Tackle** (E-C). Windlass, rope and kibble.
- Tahona** (S-M). A mill of small horizontal stones.
- Tailings** (A). The auriferous earth that has once been washed and deprived of the greater portion of the gold it contained.
- Tajadera** (S-M). Wedge to break the tinus.
- Tajamanil** (S-M). Shingle for roofing.
- Tajo Abierto** (S-M). An open cut.
- Tajo** (S-M). A cut.
- Talegra** (S-M). A bag of 1,000 dollars.
- Tamping** (A). The material used to confine gunpowder in blasting.
- Tanda-tarea** (S-M). A task; compulsory.
- Tapajos** (S-M). Bandage for the eyes, either men or mules.
- Telegraph** (A). A high and narrow flume, used in hydraulic mining.
- Telurio** (S-M). Tellurium.
- Tellurium** (L). A bright gray metal.
- Tenates** (S-M). Sacks, bags of hides, leather, or cloth.
- Tenderfoot** (A). A novice in the art of mining; a new beginner.
- Tentadura** (S-M). An assay or trial.
- Testera** (S-M). A dike interrupting the course of a lode.
- Test Lead** (E-C). Lead refined and granulated for assayers.
- Ticketings** (A). The sale of ore.
- Tierra Pesada** (S-M). Barytes.
- Tienda de Vaya** (S-M). A store at which miners obtain weekly credit.
- Tina** (S-M). A vat, or jar.
- Tin** (E-C). A white metal; the tinware in use consists of sheet iron coated with tin.

Tincal (S-M). Crude borax.

Timbering (A). Placing timbers in a mine to prevent caving of roof.

Tiro (S-M). A shaft.

Tiro de Mulas (S-M). A team of mules.

Topaz (L). A yellowish gem.

Tornero (S-M). A wooden vat.

Torta (S-M). A cake of ore from amalgamation process; a flat mass of mineral.

Tortilla (S-M). A thin, unleavened cake of cornmeal.

Tossing (E-C). Suspending the ores in water by violent agitation, the lighter and worthless matter remaining uppermost.

Trapiche (S-M). Grinding mill.

Trachytes (F). A rough-feeling, grayish variety of lava, consisting of entangled crystals of feldspar.

Trap Rocks (A). Step-like masses of volcanic lava rock—crystalline, basaltic, clinkstone, greenstone, feldstones, trap tuffs.

Treasure (A). Wealth, accumulated abundance.

Trementina (S-M). Turpentine.

Trench (A). To dig a ditch; a ditch.

Tributers (E-C). Miners who work a piece of ground or lode and pay a royalty to the owners, but hold no title to the property.

Triangulos (S-M). The cogs of a stamp.

Tribunal de Minería (S-M). A mining tribunal.

Trio General (S-M). The main shaft.

Triturate (A). To grind or pulverize.

Trunking (A). Extracting ores from the slimes.

Tummals (A). A great quantity; a heap; a pile.

Tufa (S-M). Volcanic sandstone; soft, porous rock; calcareous.

Tunnel (A). A level, driven at right angles to the vein, which its object is to reach.

Turba (S-M). Turf, peat.

Turbit (L). Mineral; yellow oxide; a sulphuret of mercury.

Turning House (E-C). The first cutting on the lode after it is cut in a crosscut.

Tut-work (E-C). Piece work; given price per yard or foot.

Tying (E-C). Washing.

U

Undermine (A). To excavate the earth beneath; to injure in an underhanded way.

Upcast (E-C). A shaft for ventilating.

Unfold (E-C). To disclose mineral.

Upset Price (A). In auctions, the price at which goods are started by the auctioneer and under which they can not be sold.

Utahcerite (A). A new mineral wax or paraffin, found in Utah, similar to ozocerite.

V

- V Flume (A). See under "Miscellaneous." p 78.
- Valley Tan (in Utah). Native whisky.
- Vallecito (S-M). Little valley.
- Vara (S-M). A Spanish yard; thirty-three inches, English.
- Vein (A). Aggregations of mineral matter in fissures of rocks.
- Velador (S-M). A watchman; in charge day and night.
- Velas (S-M). Candles.
- Velocity (A). Rate of motion.
- Vena (S-M). Small branches of the main vein.
- Veta Madre (S-M). The mother or principal vein.
- Vidrio (S-M). Glass.
- Vigas (S-M). Beams; split or sawed timber.
- Vitreous (L). Having the appearance of glass.
- Vitriolo (S-M). Vitriol.
- Vitriolo Azul (S-M). Blue vitriol.
- Vitriolo Blanco (S-M). White vitriol.
- Vitriolo Verde (S-M). Green vitriol, or copperas.
- Voladiras (S-M). Grinding stones at the arrastras.
- Volcanic Rock (A). Lava, trachyte, basalt lava, obsidian, pumice, scoria, tufa—composed mostly of augite and feldspar.

W

Walls (A). The side next to the lode.

Wash (A). The first geological formation, being composed of earth, sand, gravel and other minerals "washed" down from the mountains during a long series of ages.

Whim (A). A machine for raising ores and refuse.

Windlass (A). A wheel arranged to raise weights.

Winze (D). A shaft sunk from one level to the other.

X

Xabon (S-M). Soap; a peculiar description of ore.

Y

Yesca (S-M). Tinder, or touchwood.

Yeso (S-M). Sulphur of lime.

Yungue (S-M). An anvil.

Z

Zacate (S-M). Maize, straw or grass, given to the work mules or animals.

Zanca (S-M). A ditch.

Zawn (E-C). A cavern.

Zinc (A). A whitish metal.

Zurron (S-M). Sacks made of leather; cochineal is packed in zirrones.

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Alloy by Combination—

Zinc and copper make bell metal.

Copper and tin make bronze metal.

Tin, copper, antimony and bismuth make britania metal.

Copper and tin make cannon metal.

Copper, tin, zinc and lead make bronze.

Copper and zinc make Dutch gold.

Copper, nickel and zinc, with a little iron and tin, make German silver.

Gold and copper make standard gold.

Certain proportions of copper and zinc make mosaic gold.

Tin and lead make pewter.

Lead and a little arsenic make sheet metal.

Silver and copper make standard silver.

Tin and lead make solder.

Lead and antimony make type metal.

Copper and arsenic make white copper.

A cubic foot of fresh water weighs sixty-two and one-half pounds, and contains seven and one-half United States gallons. Thirty-six cubic feet weigh one ton. Thirty-five feet of salt water is the same weight. The specific gravity of different seas vary—that of the Baltic sea being 1015; Mediterranean, 1029; Irish channel, 1028; Dead sea, 1240.

**Boiling Points of Various Liquids Under Pressure
of One Atmosphere.**

	Deg. Fah.
Alcohol	173
Ammonia	140
Benzine	176
Bromine	145
Chloroform	140
Linseed oil	557
Mercury	648
Nitric acid	248
Oil of turpentine	315
Phosphorus	554
Sea water.....	213
Saturated brine	216
Sulphur	570
Sulphuric acid	590
Sulphuric ether	100
Sulphuric of carbon.....	118
Water	212
Wood spirits.....	150

Temperature at Which Different Substances Become
Combustible and Ignite Without a Spark of
Either Electricity or Fire.

	Deg. Fah.
Bisulphide of carbon.....	300
Charcoal, made by distilling wood at 500 degrees..	660
Charcoal, made at 600 degrees.....	700
Charcoal, the most inflammable willow used for gunpowder	580
Equal parts chlorate of potash and sulphur.....	395
Fulminate of mercury.....	392
Fulminating powder.....	374
Gunpowder	563
Gun cotton	428
Nitroglycerine	494
Oak—dry wood	900
Phosphorus	140
Picrate powder for cannon.....	716
Picrate powder for muskets.....	576
Picrate powder for torpedoes.....	570
Picrate of mercury—iron or lead.....	565
Rifle powder.....	550
Steam, at 240 pressure per square inch.....	403
Sulphur	400
Very dry pine wood.....	800

**The Standard Units Adopted in United States and
England Are:**

Of **capacity**, the cubic foot, pint and gallon. Of **heat**, the amount required to raise one pound of water 1 degree Fahrenheit, or from 32 degrees to 33 degrees Fahrenheit. Of **length**, the inch, foot and yard. Of **pressure**, the atmosphere at sea level with the barometer at thirty inches of mercury. Of **surface**, the square foot, yard and inch. Of **time**, the second, minute and hour—the same in all civilized countries. Of **duration**, the twenty-fourth part of a solar day, called an hour, which contains sixty minutes, each of which is divided into sixty seconds. Of **weight**, is the pound. The **work** is the foot-pound, which is the force necessary to raise one pound one foot. Of **velocity**, in case of falling bodies, projectiles, etc., is expressed in feet per second; and in light and electricity, in miles, etc.—slightly different in different countries.

Melting Points of Metals.

Name.	Deg. Fah.
Alloy—3 lead, 2 tin, 5 bismuth.....	.200
Alloy—1 tin, 1 lead.....	370-460
Aluminium	1.160
Aluminium bronze	1.700
Antimony .....	.810
Bismuth .....	.518
Brass	1.650
Bronze	1.690
Copper	2.000
Gold—coin	2.156
Iron—cast (white).....	2.075
Iron—cast (gray).....	2.264
Iron—wrought	3.000-3.500
Lead .....	.630
Magnesium	1.200
Mercury	—36
Platinum	3.500
Steel	2.370-2.550
Silver	1.830
Sulphur .....	.239
Tin .....	.455
Wax—white .....	.154
Zinc .....	.793

Weight and Specific Gravity of Various Metals.

NAME	Weight per Cubic Foot, Pounds	Weight per Cubic Inch, Pounds	Specific Gravity
Aluminium .....	.166	.096	2.07
Antimony .....	.419	.242	6.72
Bismuth .....	.613	.353	9.822
Brass—cast .....	.524	3.	8.4
Bronze .....	.534	.308	8.561
Copper—cast .....	.537	.31	8.607
Copper wire.....	.555	.32	8.9
Gold—24 karat.....	1.208	.697	19.361
Gold—standard	1.106	.638	17.724
Gun metal.....	.528	.304	8.459
Zinc .....	.437	.252	7.
Iron—cast .....	.450	.26	7.21
Iron—wrought .....	.485	.28	7.78
Lead—cast .....	.708	.408	11.36
Lead—rolled .....	.711	.41	11.41
Mercury .....	.845	.489	13.596
Platinum	1.344	.775	21.531
Platinum—sheet	1.436	.828	23.
Silver—pure .....	.654	.377	10.474
Silver—standard .....	.644	.371	10.312
Steel .....	.490	.284	7.85
Tin—cast .....	.455	.262	7.291

Values of Foreign Coins and Currencies.

A—Countries with fixed currencies.

The following official (United States treasury) valuations of foreign coins do not include "rates of exchange."

COUNTRIES.	STANDARD.	MONEY UNIT.	Value in U.S. gold	COINS.
Argentina Republic	Gold and silver	Peso	\$0.965	Gold—argentine (\$4.824) and $\frac{1}{2}$ argentine; silver—peso and divisions.
Austria-Hungary*	Gold	Crown	.203	Gold—20 crowns (\$4.052) and 10 crowns.
Belgium	Gold and silver	Franc	.193	Gold—10 and 20 franc pieces; silver—5 francs.
Brazil	Gold	Milreis	.546	Gold—5, 10, and 20 milreis; silver— $\frac{1}{2}$, 1, and 2 milreis.
British N. America (except Newfoundland).	Gold	Dollar	1.00	
British Honduras	Gold	Dollar	1.00	
Chile	Gold	Peso	.365	Gold—escudo (\$1.25), doubloon (\$3.65), and condor (\$7.30); silver—peso and divisions.
Costa Rica	Gold	Colon	.465	Gold—2, 5, 10, and 20 colons; silver—5, 10, 25, and 50 centesimos.
Cuba	Gold and silver	Peso	.926	Gold—doubloon (\$5.017); silver—peso (60 cents).
Denmark	Gold	Crown	.268	Gold—10 and 20 crowns.
Egypt	Gold	Pound (100 piasters).	4.943	Gold—10, 20, 50, and 100 piasters; silver—1, 2, 10, and 20 piasters.
Finland	Gold	Mark	.193	Gold—10 and 20 marks (\$1.93 and \$3.859).
France	Gold and silver	Franc	.193	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.

* The gold standard went into effect January 1, 1900. Values are still sometimes expressed in the florin, which is worth 2 crowns.

Values of Foreign Coins and Currencies—Continued.

COUNTRIES.	STANDARD.	MONEY UNIT.	Value in U.S. gold	COINS.
Germany	Gold	Mark	.238	Gold—5, 10, and 20 marks.
Great Britain	Gold	Pound sterling	4.866½	Gold—sovereign (pound sterling) and half sovereign.
Greece	Gold and silver	Drachma	.193	Gold—5, 10, 20, 50, and 100 drachmas; silver—5 drachmas.
Haiti	Gold and silver	Gourde	.965	Silver—gourde.
India	Gold	Rupee	.324	Gold—sovereign (\$4.8665); silver—rupee and divisions.
Italy	Gold and silver	Lira	.193	Gold—5, 10, 20, 50, and 100 lire; silver—5 lire.
Japan †	Gold	Yen	.498	Gold—1, 2, 5, 10, and 20 yen.
Liberia	Gold	Dollar	1.00	
Netherlands	Gold and silver	Florin	.402	Gold—10 florins; silver—½, 1, and 2½ florins.
Newfoundland	Gold	Dollar	1.014	Gold—\$2 (\$2.027).
Peru ‡	Gold	Sol	.487	Gold—libra (\$4.8665); silver—sol and divisions.
Portugal	Gold	Milreis	1.08	Gold—1, 2, 5, and 10 milreis.
Russia	Gold	Ruble	.515	Gold—imperial (\$7.718) and ½ imperial (\$3.80); silver—½, ¼, and 1 ruble.
Spain	Gold and silver	Peseta	.193	Gold 25 pesetas; silver—5 pesetas.
Sweden and Norway	Gold	Crown	.268	Gold 10 and 20 crowns.
Switzerland	Gold and silver	Franc	.193	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Turkey	Gold	Piaster	.044	Gold—25, 50, 100, 200, and 500 piasters.
Uruguay	Gold	Peso	1.034	Gold peso; silver—peso and divisions.
Venezuela	Gold and silver	Bolivar	.193	Gold—5, 10, 20, 50, and 100 bolivars; silver—5 bolivars.

† Gold standard adopted October 1, 1897.

‡ Gold standard adopted October 13, 1900.

Values of Foreign Coins and Currencies—Continued.

B—Countries with fluctuating currencies, 1874-1896.

COUNTRIES.	STANDARD.	MONETARY UNIT.	Value in terms of the United States gold dollar on January 1, 1902.			
			1874.	1890.	1891.	1896.
Austria-Hungary*	Silver	Florin	\$0.476	\$0.42	\$0.381	---
Bolivia	Silver	Dollar until 1880; boliviano thereafter.	.965	.85	.771	\$0.491
Central America	Silver	Peso	.965	.85	.771	.491
China	Silver	Haikwan tael	1.61	---	---	---
Colombia	Silver	Peso	.965	.85	.771	.491
Ecuador	Silver	Peso	.965	.85	.771	.491
Egypt†	Gold	Pound (100 piasters)	---	---	---	---
India	Silver	Rupee	.458	.404	.366	.233
Japan	Gold	Yen	.997	.997	---	---
Mexico	Silver	Dollar	---	.917	.831	.529
Netherlands‡	Silver	Florin	1.047½	.923	.837	.533
Peru	Gold and Silver	Sol	.405	---	---	---
Russia	Silver	Ruble	.925	.85	.771	.491
Tripoli	Silver	Mahbub of 20 piasters	.7717	.68	.617	.393
			.8709	.767	.695	.443

* The silver standard prevailed in Austria-Hungary up to 1892. The law of August 2 of that year established the gold standard.

† The Egyptian pound became fixed in value at \$4.943 in 1887.

‡ The Netherlands florin fluctuated up to the year 1880, when it became fixed at 40.2 cents.

Value of Foreign Coins and Currencies—Concluded.

C—Valuations of fluctuating currencies.

COUNTRIES.	MONETARY UNIT	1898.	1899.	1900.	1901.
Bolivia.....	Slvr. boliviano	\$ 0.436	\$ 0.436	\$ 0.427	\$ 0.468
Central America	Silver peso....	.436	.436	.427	.465
	Amoy tael....	.706	.705	.691	.757
	Canton tael....	.704	.703	.689	.755
	Chefoo tael....	.675	.674	.661	.724
	Chinkiang tael	.69	.689	.675	.74
	Fuchau tael...	.653	.652	.64	.701
	Haikwan teal..	.718	.718	.703	.771
China	Hankau tael...	.66	.66	.647	.709
	Hongkong tael	(*)	(*)	(*)	(*)
	Ningpo tael...	.979	.678	.665	.728
	Niuchwang				
	tael .....	.662	.661	.648	.71
	Shanghai tael.	.645	.644	.631	.692
	Swatow tael...	.652	.651	.639	.70
Colombia.....	Takao tael....	.71	.71	.696	.762
	Tientsin tael..	.684	.683	.67	.734
	Silver peso....	.436	.436	.427	.468
Ecuador.....	Silver peso....	.436	.436	.427	.468
India.....	Silver rupee†..	.207	.207	.203	-----
Mexico.....	Silver dollar...	.474	.474	.464	.509
Persia.....	Silver kran....	.08	.08	.079	.086
Peru.....	Silver sol.....	.436	.436	.427	-----

*The "British dollar" has the same legal value as the Mexican dollar in Hongkong, the Straits Settlements, and Labuan.

†The sovereign is the standard coin of India, but the rupee is the money of account.

Foreign Weights and Measures.

The following table embraces only such weights and measures as are given from time to time in United States consular reports and in commercial relations.

Foreign weights and measures with American equivalents.

DENOMINATIONS.	WHERE USED.	AMERICAN EQUIVALENT.
Almude	Portugal	4.422 gallons.
Ardeb	Egypt	7.6907 bushels.
Are	Metric	0.02471 acre.
Arobe	Paraguay	25 pounds.
Arratel or libra	Portugal	1.001 pounds.
Arroba (dry)	Argentine Republic	25.3175 pounds.
Arroba (dry)	Brazil	32.38 pounds.
Arroba (dry)	Cuba	25.3664 pounds.
Arroba (dry)	Portugal	32.38 pounds.
Arroba (dry)	Spain	25.36 pounds.
Arroba (dry)	Venezuela	25.4024 pounds.
Arroba (liquid)	Cuba, Spain and Venezuela	4.263 gallons.
Arshine	Russia	28 inches.
Arshine (square)	Russia	5.44 sq. feet.
Artel	Morocco	1.12 pounds.
Baril	Argentine Republic and Mexico	20.0787 gallons.
Barrel	Malta (customs)	11.4 gallons.
Barrel	Spain (raisins)	100 pounds.
Berkovets	Russia	361.12 pounds.
Bongkal	India	832 grains.
Bouw	Sumatra	7,096.5 sq. mtrs.
Bu	Japan	0.1 inch.
Butt (wine)	Spain	140 gallons.
Caffiso	Malta	5.4 gallons.
Candy	India (Bombay)	529 pounds.
Candy	India (Madras)	500 pounds.
Cantar	Morocco	113 pounds.
Cantar	Syria (Damascus)	575 pounds.
Cantar	Turkey	124.7036 pounds.
Cantaro (cantar)	Malta	175 pounds.
Carga	Mexico and Salvador	300 pounds.
Catty	China	1.333½ (1½) lbs.
Catty*	Japan	1.31 pounds.
Catty	Java, Siam and Malacca	1.35 pounds.
Catty	Sumatra	2.12 pounds.
Centaro	Central America	4.2631 gallons.
Centner	Bremen and Brunswick	117.5 pounds.
Centner	Darmstadt	110.24 pounds.
Centner	Denmark and Norway	110.11 pounds.
Centner	Nuremberg	112.43 pounds.
Centner	Prussia	113.44 pounds.
Centner	Sweden	93 7 pounds.
Centner	Vienna	123.5 pounds.
Centner	Zollverein	110.24 pounds.
Centner	Double or metric	220.46 pounds.
Chetvert	Russia	5.7748 bushels.
Chih	China	14 inches.
Coyan	Sarawak	3.098 pounds.
Coyan	Siam Koyan)	2.667 pounds.
Cuadra	Argentine Republic	4.2 acres.
Cuadra	Paraguay	78.9 yards.
Cuadra	Paraguay (square)	8.077 square feet.
Cuadra	Uruguay	Nearly 2 acres.
Cubic meter	Metric	35.3 cubic feet.
Cwt. (hundredweight)	British	112 pounds.
Dessiatine	Russia	2.6997 acres.
Dessiatine	Spain	1.599 bushels.
Drachme	Greece	Half ounce.
Fanega (dry)	Central America	1.5745 bushels.

*More frequently called "kin." Among merchants in the treaty ports it equals 1.33½ pounds avoirdupois.

Foreign Weights and Measures—Continued.

DENOMINATIONS.	WHERE USED.	AMERICAN EQUIVALENT.
Fanega (dry) -----	Chile -----	2.575 bushels.
Fanega (dry) -----	Cuba -----	1.599 bushels.
Fanega (dry) -----	Mexico -----	1.54728 bushels.
Fanega (dry) -----	Morocco -----	Strike fanega, 70 lbs.; full fa- nega, 118 lbs.
Fanega (dry) -----	Uruguay (double) -----	7.776 bushels.
Fanega (dry) -----	Uruguay (single) -----	3.888 bushels.
Fanega (dry) -----	Venezuela -----	1.599 bushels.
Fanega (liquid) -----	Spain -----	16 gallons.
Feddan -----	Egypt -----	1.03 acres.
Frail (raisins) -----	Spain -----	50 pounds.
Frasco -----	Argentine Republic -----	2.5096 quarts.
Frasco -----	Mexico -----	2.5 quarts.
Frasila -----	Zanzibar -----	35 pounds.
Fuder -----	Luxembourg -----	264.17 gallons.
Funt -----	Russia -----	0.9028 pound.
Garnice -----	Russian Poland -----	0 88 gallon.
Gram -----	Metric -----	15.432 grains.
Hectare -----	Metric -----	2.471 acres.
Hectoliter (dry) -----	Metric -----	2.838 bushels.
Hectoliter (liquid) -----	Metric -----	26.417 gallons.
Joch -----	Austria-Hungary -----	1.422 acres.
Ken -----	Japan -----	6 feet.
Kilogram (kilo) -----	Metric -----	2.2046 pounds.
Kilometer -----	Metric -----	0.621376 mile.
Klafter -----	Russia -----	216 cubic feet.
Koku -----	Japan -----	4.9629 bushels.
Korree -----	Russia -----	3.5 bushels.
Kwan -----	Japan -----	8.28 pounds.
Last -----	Belgium and Holland -----	85.134 bushels.
Last -----	England (dry malt) -----	82.52 bushels.
Last -----	Germany -----	2 metric tons (4,480 pounds).
Last -----	Prussia -----	112.29 bushels.
Last -----	Russian Poland -----	11½ bushels.
Last -----	Spain (salt) -----	4.760 pounds.
League (land) -----	Paraguay -----	4,633 acres.
Li -----	China -----	2,115 feet.
Libra (pound) -----	Argentine Republic -----	1.0127 pounds.
Libra (pound) -----	Central America -----	1.043 pounds.
Libra (pound) -----	Chile -----	1.014 pounds.
Libra (pound) -----	Cuba -----	1.0161 pounds.
Libra (pound) -----	Mexico -----	1.01465 pounds.
Libra (pound) -----	Peru -----	1.0143 pounds.
Libra (pound) -----	Portugal -----	1.011 pounds.
Libra (pound) -----	Spain -----	1.0144 pounds.
Libra (pound) -----	Uruguay -----	1.0143 pounds.
Libra (pound) -----	Venezuela -----	1.0161 pounds.
Liter -----	Metric -----	1.0567 quarts.
Livre (pound) -----	Greece -----	1.1 pounds.
Livre (pound) -----	Guiana -----	1.0791 pounds.
Load -----	England (timber) -----	Square, 50 cubic ft.; unhewn, 40 cubic ft.; inch planks, 600 su- perficial ft.
Manzana -----	Costa Rica -----	1½ acres.
Manzana -----	Nicaragua and Salvador -----	1.727 acres.
Marc -----	Bolivia -----	0.507 pound.
Maund -----	India -----	82½ pounds.
Meter -----	Metric -----	39 37 inches.
Mil -----	Denmark -----	4.68 miles.
Mil -----	Denmark (geographical) -----	4.61 miles.
Milla -----	Nicaragua and Honduras -----	1.1493 miles.
Morgen -----	Prussia -----	0.63 acre.
Oke -----	Egypt -----	2.7225 pounds.

Foreign Weights and Measures—Concluded.

DENOMINATIONS.	WHERE USED.	AMERICAN EQUIVALENT.
Oke	Greece	2.84 pounds.
Oke	Hungary	3.0817 pounds.
Oke	Turkey	2.82838 pounds.
Oke	Hungary and Wallachia	2.5 pints.
Pic	Egypt	21½ inches.
Picul	Borneo and Celebes	135.64 pounds.
Picul	China, Japan and Sumatra	133½ pounds.
Picul	Java	135.1 pounds.
Pie	Philippine Islands	137.9 pounds.
Pie	Argentine Republic	0.9478 foot.
Pie	Spain	0.91407 foot.
Pik	Turkey	27.9 inches.
Pood	Russia	36.112 pounds.
Pund (pound)	Denmark and Sweden	1.102 pounds.
Quarter	Great Britain	8.252 bushels.
Quarter	London (coal)	36 bushels.
Quintal	Argentine Republic	101.42 pounds.
Quintal	Brazil	130.06 pounds.
Quintal	Castile,*Chile, Mexico and Peru	101.41 pounds.
Quintal	Greece	123.2 pounds.
Quintal	Newfoundland (fish)	112 pounds.
Quintal	Paraguay	100 pounds.
Quintal	Syria	125 pounds.
Quintal	Metric	220.46 pounds.
Rottle	Palestine	6 pounds.
Rottle	Syria	5¼ pounds.
Sagen	Russia	7 feet.
Salm	Malta	490 pounds.
Se	Japan	0.02451 acres.
Seer	India	1 lb. 13 ozs.
Shaku	Japan	11.9305 inches.
Sho	Japan	1.6 quarts.
Standard (St. Petersburg)	Lumber measure	165 cubic feet.
Stone	British	14 pounds.
Suerte	Uruguay	2,700 cuadras (see cuadra).
Sun	Japan	1.193 inches.
Tael	Cochin China	590.75 gr. (troy).
Tan	Japan	0 25 acre.
To	Japan	2 pecks.
Ton	Space measure	40 cubic feet.
Tonde (cereals)	Denmark	3.94783 bushels.
Tondeland	Denmark	1.36 acres.
Tsubo	Japan	6 feet square.
Tsun	China	1.41 inches.
Tunna	Sweden	4.5 bushels.
Tunnland	Sweden	1.22 acres.
Vara	Argentine Republic	34.1208 inches.
Vara	Central America	32.87 inches.
Vara	Chile and Peru	33.367 inches.
Vara	Cuba	33.384 inches.
Vara	Curacao	33.375 inches.
Vara	Mexico	33 inches.
Vara	Paraguay	34 inches.
Vara	Spain	0.914117 yard.
Vara	Venezuela	33.384 inches.
Verdo	Russia	2.707 gallons.
Vergees	Isle of Jersey	71.1 square rods.
Verst	Russia	0.663 mile.
Vlocka	Russia Poland	41.98 acres.

*Although the metric weights are used officially in Spain, the Castile quintal is employed in commerce in the Peninsula and colonies, save in Catalonia; the Catalan quintal equals 91.71 pounds.

Metric Weights and Measures.**METRIC WEIGHTS.**

Milligram (1/1000 gram) equals 0.0154 grain.
Centigram (1/100 gram) equals 0.1543 grain.
Decigram (1/10 gram) equals 1.5432 grains.
Gram equals 15.432 grains.
Decagram (10 grams) equals 0.3527 ounce.
Hectogram (100 grams) equals 3.5274 ounces.
Kilogram (1,000 grams) equals 2.2046 pounds.
Myriagram (10,000 grams) equals 22.046 pounds.
Quintal (100,000 grams) equals 220.46 pounds.
Millier or tonneau—ton (1,000,000 grams)—equals
2,204.6 pounds.

METRIC DRY MEASURE.

Milliliter (1/1000 liter) equals 0.061 cubic inch.
Centiliter (1/100 liter) equals 0.6102 cubic inch.
Deciliter (1/10 liter) equals 6.1022 cubic inches.
Liter equals 0.908 quart.
Decaliter (10 liters) equals 9.08 quarts.
Hectoliter (100 liters) equals 2.838 bushels.
Kiloliter (1,000 liters) equals 1.308 cubic yards.

METRIC LIQUID MEASURE.

Milliliter (1/1000 liter) equals 0.0388 fluid ounce.
Centiliter (1/100 liter) equals 0.388 fluid ounce.
Deciliter (1/10 liter) equals 0.845 gill.
Liter equals 1.0567 quarts.
Decaliter (10 liters) equals 2.6418 gallons.
Hectoliter (100 liters) equals 26.418 gallons.
Kiloliter (1,000 liters) equals 264.18 gallons.

METRIC MEASURES OF LENGTH.

Millimeter (1/1000 meter) equals 0.0394 inch.
Centimeter (1/100 meter) equals 0.3937 inch.
Decimeter (1/10 meter) equals 3.937 inches.
Meter equals 39.37 inches.
Decameter (10 meters) equals 39.37 inches.

Hectometer (100 meters) equals 328 feet 1 inch.

Kilometer (1,000 meters) equals 0.62137 mile (3,280 feet 10 inches).

Myriameter (10,000 meters) equals 6.2137 miles.

METRIC SURFACE MEASURE.

Centare (1 square meter) equals 1,550 square inches.

Are (100 square meters) equals 119.6 square yards.

Hectare (10,000 square meters) equals 2.471 acres.

The metric system has been adopted by the following named countries: Argentine Republic, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, United States of America, and Venezuela.

It is no uncommon thing to see, in a Western mining camp, an illiterate millionaire in greasy buckskin, and a college graduate in rags.

Miles.

The Irish mile is 2,240 yards.

The Swiss mile is 9,153 yards.

The Italian mile is 1,766 yards.

The Scotch mile is 1,984 yards.

The Tuscan mile is 1,808 yards

The German mile is 8,106 yards.

The Arabian mile is 2,143 yards.

The Turkish mile is 1,826 yards.

The Flemish mile is 6,869 yards.

The Vienna post mile is 8,296 yards.

The Roman mile is 1,628, or 2,025 yards.

The Werst Mile is 1,167, or 1,367 yards.

The Dutch and Prussian mile is 6,480 yards.

The Swedish and Danish mile is 7,341.5 yards.

The English and American mile is 1,760 yards.

General Information.

The following tables were prepared by Mr. S. S. Burt, of Chicago, Ill., a noted expert mine examiner, whose "trail" extends from Behring straits to Cape Horn:

The United States mints receive old gold or gold dust washed from the beds of streams, or extracted from the rocks, for assaying and refining, and pay for the same in legal tender whatever it is worth, but never sell gold to any one except in the form of coin.

Gold and silver are bought and sold by troy weight, 24 grains one pennyweight, 20 pennyweights one ounce, 12 ounces one pound.

The price established by the United States government for pure gold is \$20.67 per ounce, that is for gold 1000 fine, or 24 karats.

The term karat is used by jewelers to express the degrees of fineness of gold, dividing it into 24 degrees or karats.

Pure gold is 24 karats fine and worth $4\frac{1}{3}$ cents per grain, $4\frac{1}{3}$ cents karat, or \$20.67 per ounce. One pound pure gold, 1000 fine, troy weight, is worth \$248.04.

Per Ounce.

22-karat gold is worth.....	\$18.94
20-karat gold is worth.....	17.22
18-karat gold is worth.....	15.50
16-karat gold is worth.....	13.78
14-karat gold is worth.....	12.05
12-karat gold is worth.....	10.33 $\frac{1}{2}$
10-karat gold is worth.....	8.61
8-karat gold is worth.....	6.89

	Per Ounce.
Gold 1000 fine is worth.....	\$20.67
Gold 900 fine is worth.....	18.60
Gold 800 fine is wirth.....	16.53
Gold 700 fine is worth.....	14.47
Gold 600 fine is worth.....	12.40
Gold 500 fine is worth.....	10.33½
Gold 400 fine is worth.....	8.26
Gold 300 fine is worth.....	6.20
Gold 200 fine is worth.....	4.13
Gold 100 fine is worth.....	2.06

Many persons are mistaken in thinking all ounces are alike. An ounce troy or apothecaries' weight contains 480 troy grains; an ounce avoirdupois weight contains 437½ troy grains.

The grain is the unit of troy and apothecaries' weight, and the ounce is the unit of avoirdupois weight.

One pound troy or apothecaries' weight contains 5,760 troy grains. One pound avoirdupois weight contains 7,000 troy grains.

United States Mint Information.

One dollar, United States gold coin unit of value, contains 25 $\frac{8}{10}$ troy grains.

Two and a half dollars, United States gold coin unit of value, contains 64 $\frac{5}{10}$ grains.

Five dollars, United States gold coin unit of value, contains 129 troy grains.

Ten dollars, United States gold coin unit of value, contains 258 troy grains.

Twenty dollars, United States gold coin unit of value, contains 516 Troy grains.

One silver dollar, United States coin unit of value, contains 412 $\frac{1}{2}$ troy grains.

One thousand dollars, United States gold coin, weighs 59 $\frac{1}{4}$ ounces avoirdupois, 54 ounces troy weight, or 4 $\frac{1}{2}$ pounds.

One pennyweight of gold, 1000 fine, is worth \$1.03 $\frac{7}{20}$ troy pounds.

Five thousand dollars, United States gold coin, weighs 268 $\frac{75}{100}$ ounces troy weight, or about 22 $\frac{4}{10}$ troy pounds.

One thousand silver dollars weigh 859 $\frac{38}{100}$ ounces, or 71 $\frac{6}{10}$ pounds troy weight.

Fifty thousand dollars, United States gold coin, weighs a little less than 224 troy pounds.

The value of a ton of pure gold, 1000 fine, is \$602,799.21.

One million dollars in gold coin weighs 3,685 $\frac{1}{2}$ pounds, or 1 $\frac{3}{5}$ tons.

The value of a ton of pure silver is \$37,704.84 (subject to fluctuations).

One million dollars in silver coin weighs 56,931 $\frac{1}{2}$ pounds avoirdupois, or nearly 28 $\frac{1}{4}$ tons.

Weight of a Cubic Foot of Various Metals.

	Lbs.	Oz.
Platinum	1,218	12
Pure gold.....	1,203	10
Mercury	848	12
Lead	709	8
Pure silver.....	625	13
Tin	455	11
Steel	487	12
Copper	547	4
Brass	543	12
Zinc	428	13

	Deg.
Brass melts at.....	1,900
Gold melts at.....	2,590
Platinum melts at.....	3,080
Tin melts at.....	421
Copper melts at.....	2,548
Lead melts at.....	594
Silver melts at.....	1,250
Zinc melts at.....	740
Nickel melts at.....	2,793

The first discovery of gold in California was made by J. W. Marshall in the mill race of General Sutter, January 19, 1848. The announcement of this discovery caused the wildest gold fever excitement ever experienced, not only in America, but in every part of the civilized world.

The first discovery of gold in Colorado was in 1858, on Cherry creek, and the first discovery of silver was made at Georgetown by John Huff, September 14, 1864.

The first gold mine discovered in Nevada was at Gold Hill by Joe Kirby, in 1857. The first quartz claim was located by James Finney—better known as “Old Virginia”—February 28, 1858. The rich deposit of silver ore was discovered by Peter O'Reilly and Patrick McLaughlin, June, 1859. They were engaged in gold washing, and uncovered a rich vein of sulphuret of silver when engaged in excavating a place wherein to catch a supply of water for their rockers. Kirby claimed the ground where the discovery was made, and sold his holding to a Mr. Comstock; hence, Comstock's name was given to the lode. The “Comstock” mines have yielded since their discovery over \$200,000,000, and are still being worked.

Hydraulic mining is carried on to perfection on the western slope of the Sierra Nevada mountains. The ditches and flumes extend for many miles, tapping the rivers near their sources, near the region of perpetual snow. By this means the water is conveyed over and around the hills, whence it is carried to any claim below it. The long, high and narrow flume, called a “telegraph,” carries the water to the ditch, as nearly level as possible, over the claim to be worked. To the “telegraph” is attached a hose, with an iron pipe or nozzle, through which the water rushes with great velocity. When directed against a gravel bank it cuts and tears it down, washing the dirt thoroughly. The water carries rocks, dirt and

sand through the tail race, and into the long flume, where the riffles for collecting the gold are placed. The rocks and sand are carried through the long flumes, while the gold is caught by the riffles. When desired, the water is turned off, and the miners "clean up" the gold from the flumes.

V-shaped flumes, supported by trestlework, are in use by miners in some places for bringing down timber and wood from the high mountains, at the same time using the water for mining purposes. Some of these flumes are many miles in length; one on the western slope of the Sierra Nevada mountains, in California, is over forty miles long, and delivers its freight at the town of Checo.

High wire tramways are in use in some localities for bringing down ores from elevated mines to smelters below, or for shipment.

A miner's inch of water is usually what will flow through a one-inch square orifice, with a four-inch head pressure.

Fifty miner's inches are equal to a discharge of one cubic foot of water per second of time.

To get the miner's inch in gallons, divide the number of gallons flow, or discharge, per minute by 8.9766. The result will be the number of inches sought.

To get the number of gallons in miner's inches, multiply the given number of inches by 14.961, pointing off five decimals. The result will be the number of gallons discharged per second.

The first house built in San Francisco was in 1835. The place was then called "Yuba Buena." It was changed to San Francisco in 1847, before the discovery of gold in California.

"Putting on Style."

The assumption of "aristocratic airs" is the detestation of everybody in a mining camp. No one but a "tenderfoot," or person lacking good sense, attempts it. It is neither forgotten nor forgiven. It should also be remembered that no people more admire and respect upright, moral character than do the miners and citizens in a mining camp, while, at the same time, none more thoroughly despise hypocrisy in any shape. In fact, good men and good women may be as moral and religious as they choose to be in the mining countries, and as happy as human beings can be. Much they may miss that they may have been accustomed to, and much they will receive that none offered them before.

The old miner, no matter how rough he may look or really be, will "tighten his belt" at the first symptoms of anybody disturbing a religious meeting, and "sail in" with: "Give the parson a chance, or waltz up to me!" Here is a rough, honest sense of honor, with the bark on. No hypocrisy in an old miner or plainsman.

Twin Brothers of Civilization.

The first gold mined in the world was discovered on arid lands; the first fields were cultivated on arid lands; the first flocks were distributed on arid lands; the first cities were built on arid lands; the first civilized government was organized on arid lands; the prophets of old—the chosen people of God—knew only of arid lands.

Under torrid skies, on rainless, treeless plains, agriculture, the domestication of animals, arts in metals, temple building, cities and civilization had their beginning.

In our western country mining and irrigation are "twin brothers of civilization." Their value to each

other, and their importance to the whole people of these United States, are beyond the possibility of computation.

Had the "Pilgrim Fathers" landed on the shores of Arid California, instead of Plymouth Rock, that old "blarney stone" would **now** be surrounded by the native nomadic races, and the government census would contain no record of 10,000 "abandoned farms" within a few hundred miles of the "Rock."

Irrigation is the god of the harvest. In an emergency Moses, the chief of the Israelites, "smote the rock" to obtain water. Crofutt's patent "lifts" **tap** the underflow water; then "push the button"—the water does the rest—a bountiful harvest is assured. With these "lifts" in general use, **drouth** will never menace the people of the world.

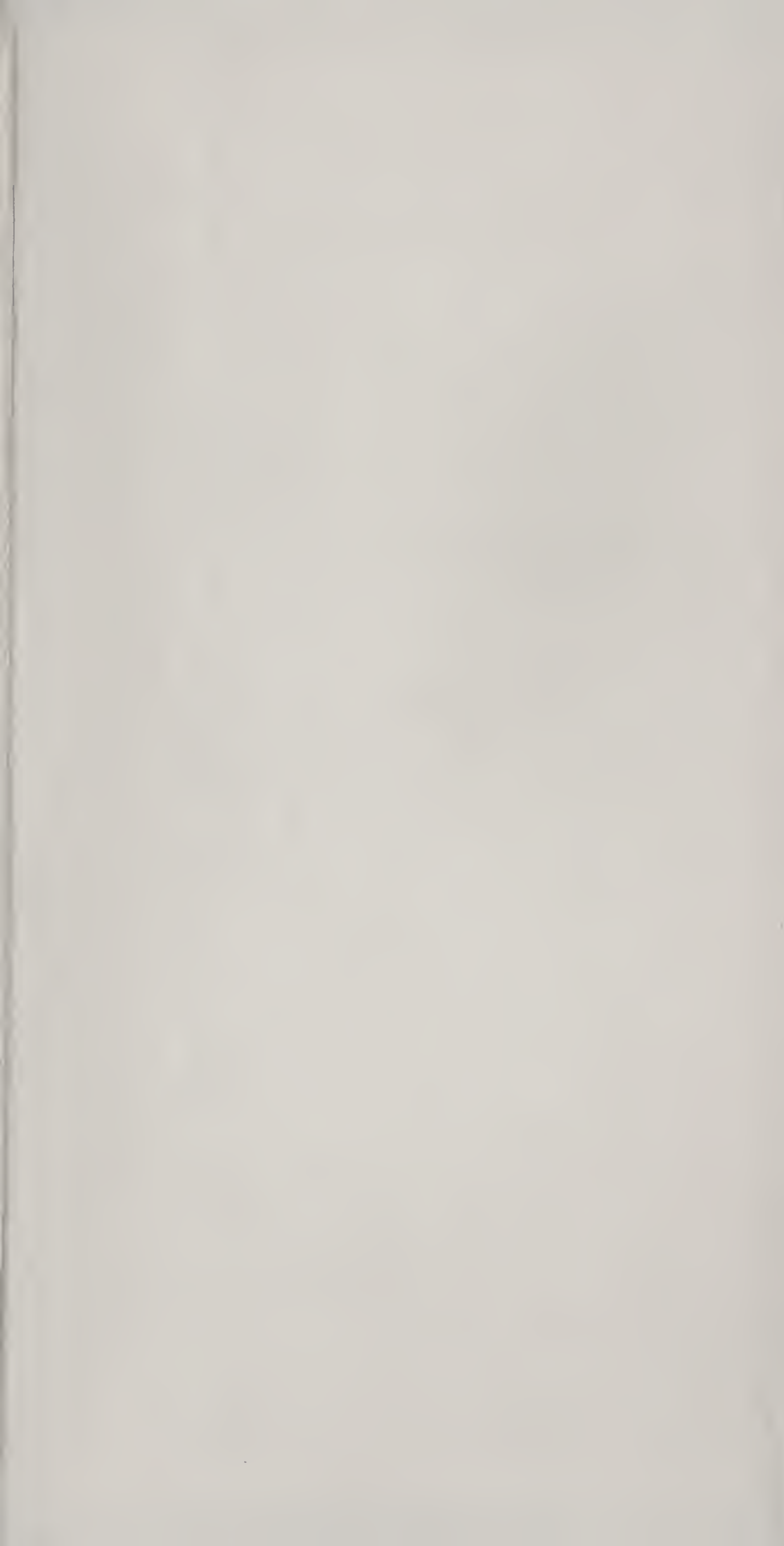
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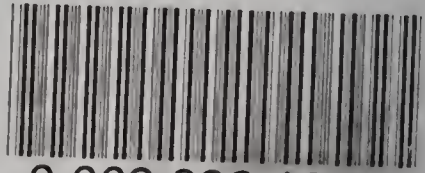
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